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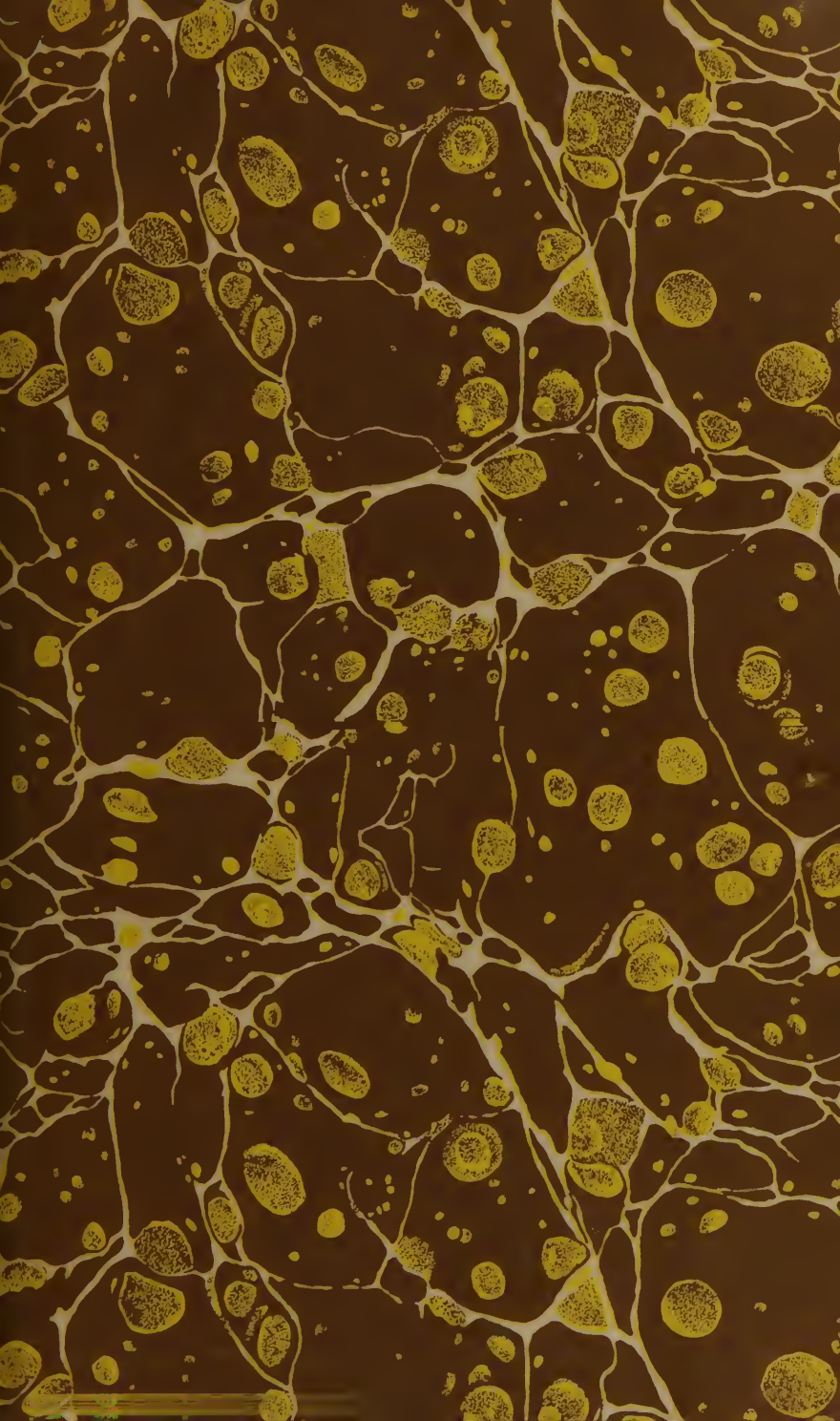
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Section

Pathology

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THE
SEATS AND CAUSES

OF

Diseases,

INVESTIGATED BY ANATOMY;

CONTAINING

A GREAT VARIETY OF DISSECTIONS,

AND

Accompanied with Remarks.

BY JOHN BAPTIST MORGAGNI,

CHIEF PROFESSOR OF ANATOMY, AND PRESIDENT OF THE UNIVERSITY AT PADUA.

ABRIDGED, AND ELUCIDATED WITH COPIOUS NOTES,

By WILLIAM COOKE,

MEMBER OF THE ROYAL COLLEGE OF SURGEONS, LONDON,—AND ONE OF THE
SECRETARIES TO THE HUNTERIAN SOCIETY.

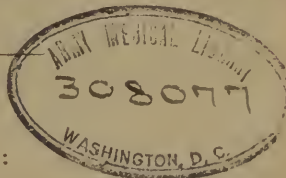
IN TWO VOLUMES.

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CHAPTER III.

DISEASES OF THE ORGANS CONCERNED IN DIGESTION.

SECTION I.

DISEASES OF THE MOUTH AND ŒSOPHAGUS.

CASE 1.

Ulceration of the soft palate, with suppuration of the lung.

THE man to whom this case refers experienced an inability to prevent partial regurgitation through the nostrils, whenever he attempted to swallow liquids. The bony palate was quite entire, but the palatum molle, and the uvula, had been destroyed by an old ulcer. As far as the eye could observe the ulcer had cicatrized, but it was evident from the sputum that ulceration was going on beyond the reach of vision. It was accompanied with a somewhat troublesome cough; and this circumstance, in conjunction with other corresponding symptoms, (although indeed they were slight and ambiguous,) excited a suspicion that an ulcer extended downwards; and this suspicion was confirmed by the man dying suddenly, as if he had been suffocated.

Dissection. The upper lobe of the left lung was indurated, and when cut into was found to have suppurated extensively. The ulcer of the mouth had extended to the upper part of the pharynx, and to

the posterior foramina of the nostrils, where the ulcerative process was advancing at the time of the man's decease.

The liver, some parts of the intestines, and the internal muscles of the abdomen, were livid, and exceedingly offensive.

Morgagni, Epist. xxviii. Article 12.

CASE 2.

Carcinomatous tumours of the larynx and pharynx.

A man fifty years of age began to complain of some impediment to deglutition. This affection gradually increased, and was accompanied with loss of voice. The effort of swallowing became painful, a portion of food lodged in the fauces, and sometimes by degrees returned into the mouth, and appeared as if it had been putrid. The body became emaciated, and the left internal maxillary gland was perceived to be indurated. In this case also, the patient died suddenly, under circumstances indicative of suffocation.

Dissection. The gland which it has been said was indurated, had matter on its inner side resembling albumen; and there were many carcinomatous tumours in the pharynx and at the upper part of the larynx.—*Valsalva, xxviii. 9.*

CASE 3.

Carcinomatous tumours ; the epiglottis perforated.

In a youth who died nearly in the same manner as the man whose case has just been related, similar tumours were discovered, especially at the upper part of the larynx, and the adjacent sides of the pharynx. The tumours were in some places ulcerated; and an ulcer had perforated the epiglottis.—*Valsalva, xxviii. 10.*

Deficiency and disease of the epiglottis.

Targioni met with an instance in which this cartilage was entirely wanting, and yet the power of speech was unimpaired, and the act of deglutition was unattended with difficulty: nevertheless, the diseases of this part are worthy of consideration. In the case referred to, the arytaenoid muscles were much thicker and stronger than usual, and might have closed the glottis, and thus have supplied the place of the epiglottis, as other parts have performed the functions of the uvula, and sometimes even of the tongue, when they were originally deficient, or had been removed by disease. But we should regard those circumstances which generally happen, and not cherish the supposition that the epiglottis is almost useless in deglutition.

Although I have frequently found the cartilages of the larynx bony in old men, I never met with ossification of the epiglottis. I do not doubt, however, that it may sometimes become less flexible and yielding—a lesion more prejudicial to the act of swallowing solid alimentary substances than fluids.

Morgagni, xxviii. 13.

Paralysis of the œsophagus.

It is needless to say much in reference to either spasm or paralysis of this tube, because examples of the former are so frequent in hysterical patients; and cases of the latter, although more rare, are not wanting. Like all other paralytic affections, it is a disease of much longer duration, and more obstinate than spasm. On this account patients have either been destroyed by hunger, or have been kept alive for twelve and fourteen months, and even for sixteen years, upon aliments conveyed into the stomach

by means of instruments. Ramazzini supported a female patient for sixty-six days by nutritive clysters; and as this is easily accomplished, it ought never to be neglected by physicians in any species of obstructed deglutition.

The case narrated by Heister in a dissertation by John Charles Spies, was, I think, an instance of slight paralysis. The patient was an aged nobleman, who, for a long period, was unable to swallow his last morsel. It remained in the fauces from one meal till pushed down at the beginning of another, unless it had previously been thrown up by hawking or coughing. This undoubtedly arose from causes similar to those by which men advanced in years, after nearly evacuating the bladder, are disabled from expelling the last drops of urine, which the enfeebled muscles are unable to eject.

Morgagni, xxviii. 14.

Disease in the glands and coats of the œsophagus ; and compression of this tube.

Sometimes there is deficiency of secretion from the mucous glands of the œsophagus, and at others they are occupied by an œdematous tumefaction.

The coats of the œsophagus are liable to ulceration, and although the ulcer may be in a healing state, or may actually have healed, it often leaves a caruncle, a callous thickening, a contraction, or even coalition of the parietes of the tube.

Every callous thickening of the coat of the gullet must not indeed be ascribed to ulceration: and adhesion of its parietes may take place from other causes, as, for instance, from tumours formed in the coats of the œsophagus, of which examples are given in the Sepulchretum.

The coats sometimes become cartilaginous, and

obliterate the canal of the œsophagus. Of this morbid state the same work contains three instances, and others might be added to them. If the cartilage should not project, the power of deglutition might remain unimpaired. Victorius Gornea communicated to me the particulars of a post mortem inspection of the body of a prince in Germany, in which he found the external coat of the œsophagus membranous, whilst the inner was of a cartilaginous texture; and towards the stomach it was ossified to the extent of an inch: nevertheless, for the last two years of his life he daily vomited about two hours after dinner, and never complained of uneasiness, or of difficulty in swallowing. When, therefore, the parietes of the gula are not contracted, and do not require dilatation, but are kept open by their own rigidity, the food seems to be urged forwards by the muscles of the pharynx, in the same way that the blood is propelled through an ossified artery by the power of the heart, and the secondary action of the vessels which may intervene betwixt the heart and the diseased vessel. These lesions in the coats of the œsophagus have generally occurred at the lower part.—*Morgagni*, xxviii. 15.

This tube has been constricted from tumefaction of its coats, and also from their being scirrhus, and filled with vomicae.—lxv. 2.

An impediment to deglutition may arise from the œsophagus being compressed by the contiguous parts. This has been effected by enlarged glands, as the thymus, the glandulæ dorsales, glands near the termination of the gullet, and others. Dilated arteries, likewise, have often produced this effect. In a case of violent inflammation of the diaphragm, related by Heister, there had been an incapability of swallowing from the pressure of the muscular fibres upon the œsophagus; and I perceived a simi-


lar obstacle in a woman in whom I ascribed it to a spasmodic affection of the fibres around the orifice in this septum, by which the œsophagus enters the abdomen—a circumstance which sometimes occurs to hysterical females.—xxviii. 16.

I have also observed that the liver may compress the lower part of the œsophagus. Winslow mentions an excavation in the posterior margin of this viscus which receives the spine and extremity of the gullet, just at the commencement of expansion into the stomach; and it may justly be supposed, that if at any time the liver becomes much enlarged, especially at the part alluded to, it may press the œsophagus close to the spine. It has also been supposed that an enlarged liver may have occasioned obstruction to the entrance of food into the stomach by removing this viscus into the umbilical region, and consequently narrowing the œsophagus.—17.

Blasius has described a case of malformation, in which this tube, passing through the thorax, was divided, but after a short space it again became a single canal. He does not mention that any difficulty of deglutition resulted from this conformation.

John Grashuis found in the œsophagus a morbid dilatation into a lateral sac, about the middle of the thorax. The facility of deglutition varied, and this circumstance never could have been explained without dissection.—18.

The œsophagus has been obstructed by the pressure of steatomatous as well as glandular tumours; and also from being compressed by a portion of lung which had become scirrhus.—lxv. 2.



SECTION II.

DISEASES OF THE STOMACH.

Abstinence.

We do not derive any information relative to the effects of abstinence from those cases of inability to take nourishment which arise in consequence of disease. Redi made experiments upon capons, by keeping some without food, and others without food and drink. None of the latter lived beyond the ninth day, whilst those which were allowed to drink survived to the sixteenth or twentieth day. He was also led to infer, that the age and strength of animals had some influence on their ability to sustain hunger.—xxviii. 4.

The following experiment of Valsalva is recorded with accuracy.

A dog was removed from the dugs of its mother a short time after being whelped, and was kept from all kinds of nourishment. On the third day it was attacked with convulsions, which varied in degree, but affected the whole body; and on the fourth day he died.

Dissection. The gall-bladder was full of bile; and the right lung was marked with a very black oblong spot. The auricles of the heart were much dilated by coagulated blood, with which the ventricles also were filled. In all the vessels the blood was coagulated. The cerebrum was flaccid, and the division into cortical and medullary substances was not very distinguishable. Both the tympana were full of a pellucid jelly. The ossicula were perfectly formed, but had a membranous softness.

Valsalva, xxviii. 5.

The convulsive affections which preceded death in some measure resembled what Valsalva observed in a woman who had abstained from food and drink for six days before her decease. Some of the appearances observed in the puppy were peculiar to the animal, but others, the turgid state of the gall-bladder, for instance, related to the starvation. Both in men and animals the bile which descends into the intestines, in these cases, is more apparent than under other circumstances, in consequence of its not being mixed with nutriment. By long abstinence from food and drink the secretions become acrid, and tend to putrefaction; wherefore these bodies, especially the bodies of dogs, speedily exhale an offensive odour. Some dogs from which Redi withheld nourishment and drink, lived thirty four days, others thirty-six, and a little whelp seemed likely to have endured the process longer than the others, had he not fallen from a window and killed himself on the twenty-fifth day. I believe, however, that Hippocrates expressed a correct opinion, when he said that young persons, and especially children, sustain abstinence with most difficulty; persons of middle age with less inconvenience than the former; but not so well as those who are advanced in years.*

Morgagni, xxviii. 6.

* Although it cannot be questioned that mankind, in a state of civilization, are habituated to excessive ingesta, yet it is equally certain that no very long season of inedia can be endured without its being detrimental to health, or destructive to life. The period will be variable according as the individual had been more or less accustomed to a distended state of the stomach. Although it is probable that the notorious Ann Moore of Tutbury, had previously supported life by extremely slender and liquid nutriment, yet, on the ninth day of total privation she was upon the very brink of death. Cases of protracted total abstinence are numerous, but most of them are not well authen-

Bulimia.

Neither Valsalva nor myself have performed any dissection of a case of bulimia unconnected with organic lesion which related to some other disease, and which having been elsewhere recorded it would be needless to repeat.

Albertini formerly related to me, that in some bodies of persons who had laboured under canine appetite, he had found the glands in the abdomen full of calcareous matter, and so hard as to turn the edge of the knife. This was particularly the case in a boy whose hunger was so excessive that he was often seized with syncope from that cause. I do not recollect whether there was diarrhœa in these cases, from the progress of the chyle being intercepted by the mesenteric glands. Bonetus found these glands in a state of infarction.—*Morgagni*, xxviii. 3.

In a case of preternatural appetite published by Kaltschmidt, the pylorus was twice its natural dia-

ticated. On the other hand, it is sometimes astonishing with how small a portion of alimentary matter a vigorous state of health may be maintained.

Many cases of fasting corroborate the opinion that water contributes to protract life when there is a total abstinence from food. In the Philosophical Trans. for 1684 it is related, that in consequence of an accident, four men were excluded from all sustenance except water for twenty-four days. Indeed persons are said to have existed for years upon little else than water, and yet have retained a considerable degree of strength and activity. In these cases the egesta are proportionate to the nutrititious quality of the ingesta. It has been recorded of a woman who, for fifty years, scarcely ever took solids, but whose chief food was whey in the summer, and milk, milk and water, or pure water in the winter, that, for sixteen years, she voided but one dejection annually; and that resembled a globulet of sheep-dung.—*Ed. Med. Essays*, vol. vi.—*Ed.*

meter, and to this the inordinate desire of food was ascribed. The intestines were inflamed.*—lxv. 7.

* The quantity of food which is sometimes consumed in cases of bulimia is most extraordinary. In numerous instances the daily weight of liquid and solid aliments has exceeded fifty pounds; and a remarkable instance is related by Dr. Mortimer, in which the daily consumption was upwards of sixty, though what the patient had swallowed was soon rejected. The patient was a youth only twelve years of age, whose feeling of inanition was so extreme, that when he was not supplied with food he would gnaw his own flesh. The food given him consisted of bread, meat, beer, milk, water, butter, cheese, sugar, treacle, puddings, pies, fruits, broths, and potatoes; and of these he swallowed 384 lbs. 2 oz. avoirdupois in six successive days, being, on an average, 64 lbs. a day. The disease continued for a year.

Dr. Burroughs has related an instance in which an inordinate appetite arose from worms. The subject was a labouring man of middle age, and he ate a roasted leg of veal at one meal; and fed at this extravagant rate for several days successively, and would eat sowthistles and different herbs as voraciously as meat. He voided worms as long as an ordinary tobacco-pipe shank, and some of them were thicker. After their expulsion his appetite gradually declined to the common standard.—*Phil. Trans.* vol. xxii. 1700.

The late W. Royston, Esq. suffered under this state of the digestive organs, which, though arising in immediate connexion with eating ice when he was heated, appeared to depend chiefly on mental inquietude. His liver was indurated throughout its substance, small in size, of a light red colour, and tuberculated. The stomach was small and nearly empty, contracted in the middle, of a dark reddish hue, and the pylorus morbidly thickened. The spleen was unnaturally firm, the artery greatly diseased, and its coats opaque. The pancreas was indurated. The coats of the bladder were thickened. The prostate gland was firm, and a little enlarged. The kidneys were half their usual size, and resembled the other viscera in the particulars which have been described. The right lung was inflamed, and this cavity contained a pint of serum having lymph floating in it. There was an opaque spot on the heart, indicative of previous carditis. There were hydatids upon the left plexus choroides. The cerebral and vertebral arteries approached to a state of ossification.

It often happens that an insatiable craving of food is associated with a disgusting depravity of appetite, so that substances ordi-

Rumination.

It never occurred to Valsalva or to me to see cases of this nature in the human body. Peyerus has collected numerous examples, some of which he supposes to have been congenital, and others the result of disease; and in relation to these sources he has described the appearances on dissecting the body of a nobleman and of a monk.*

Morgagni, xxix. 4.

narly loathed by the human stomach, as candles, cataplasms, and even the blood and flesh of the human body, are devoured with avidity. Pica, however, may exist without a tormenting voracity.

Ruysch has related a case in which the pylorus was dilated so as to admit a fist.

A modification of bulimia and polydipsia, I do not doubt, is often excited by a habit of excessive indulgence; either by eating or drinking more frequently than is necessary, or by gorging the stomach: and habits of this nature are so inimical to mental and corporal vigour, that the delinquents will generally be found of an indolent as well as of a luxurious disposition.—*Ed.*

* Mr. G. N. Hill has published the particulars of a case of this description. He found extreme tenuity of the stomach, and excessive smoothness of its inner surface.

About four years ago I had a case under my care. The patient was a youth sixteen years of age, whose digestive organs were in a most deranged state, and had been so for three or four years. His appetite was rather voracious, and soon after a meal the food returned into the mouth by morsels, without the least sickness. He had been allowed to eat animal food three times a day; and I was shown nearly two pounds of half-digested substances which he had brought up in this way after his dinner and supper. His mother supposed it to be about half the quantity he had eaten. After persevering attention to his general health, and a diminution of the ingesta, the stomach regained the power of retaining food, and the youth now enjoys good health.—*Ed.*

CASE 1.

Sudden death from gastrodynia.

A corpulent woman forty years of age, who had a sallow complexion, having eaten pickled onions, with bread made from the farina of chestnuts, began immediately to complain of pain in her stomach. The agony progressively increased in violence, and at the expiration of three hours after eating this meal she fainted; her body was bedewed with cold perspiration, and she expired.

Dissection. The abdomen was opened, under a suspicion that she had been poisoned. The viscera of this cavity were found in a natural state, except the stomach, which was distended to an extreme degree, and somewhat inflamed. The blood retained its natural fluidity.—*Valsalva*, xxix. 8.

Bread made of the farina of chestnuts is in common use amongst the people inhabiting the Alps. This woman probably had a somewhat debilitated stomach, and might have been unaccustomed to this kind of food; but I suspect there were some other circumstances latent in the gastric secretions; or a state of morbid sensibility of the nerves, rendering them peculiarly susceptible of irritation. If this really was the case, they would also be more disposed to excite sympathetic irritation in the nerves distributed to other organs, especially to the heart, which are derived from the same source as those which proceed to the stomach.—*Morgagni*, xxix. 9.

CASE 2.

Inflammation of the stomach, with excessive vomiting, during an accession of fever; the gall-bladder full of air.

A nobleman forty-two years of age, having come

from Germany to Bologna in Italy, was, at the expiration of a few months, seized with double tertian fever, the first accessions of which were mild, but the fourth paroxysm was extremely violent and protracted. His thirst was exceedingly troublesome, his tongue rough, his respiration difficult, and his pulse small and weak. He also experienced general lassitude, with pain and a sense of fulness in the stomach; and so great was his disquietude and anxiety that he was perpetually changing his position in bed. All these symptoms continued without any abatement, till the temperature of the body became intense. He then took a draught of distilled water, and the symptoms underwent temporary mitigation; but an exacerbation soon ensued, and continued violent during the night. Early in the morning he felt sick, but at first he was unable to excite vomiting even by irritating the fauces with his fingers: but he soon afterwards threw up four pints of fluid, similar to water in which chocolate had been dissolved. The odour of the fluid resembled that which usually exhales from the bodies of persons labouring under fever, and some portions of a membraniform substance floated in it, of the same colour as that of the fluid. Although the affection of the stomach appeared to be somewhat alleviated by this vomiting, yet the other symptoms not only continued, but even became more acute. In the morning the physician ordered him to be bled. The blood received into the first cup exhibited a crassamentum softer than in the natural state, and having a thin crust on its surface; and the serum was milky. The blood in the second cup deviated less from the healthy appearance. When a few hours had elapsed, the vomiting recurred; and in the course of the day about sixteen pints of fluid were ejected. During the ensuing night the symptoms

which have been specified continued violent, accompanied with delirium, and the left arm became affected with tremor. In the morning he had an attack resembling an epileptic paroxysm, in which not only the arm, but also the mouth, the eyes, and the left thigh, were extremely convulsed; and having continued for some hours, the arm was observed to be paralytic. The epileptic attacks recurred so frequently, that upwards of twenty were counted within an hour. The retchings of a green matter, still containing fragments of substance like portions of membrane, became more frequent, and singultus was troublesome. The pulse languished, and the strength decreased through the following night, the patient being harassed with gentle vomiting at one time, with delirium and singultus at another, but most frequently with spasmodic paroxysms, which, though dreadful in degree, were of a shorter duration than before. He died at twelve o'clock, and that day was the seventh after the disease commenced.

Dissection. The stomach and intestines were tinged of the same colour as the fluids which had been vomited; and the inner coat of the stomach was inflamed. All the minute vessels were exceedingly turgid with blood. There was no bile in the gall-bladder, but this cyst was distended with air.

The right lung adhered closely to the costal pleura, and both lungs were of a black colour and full of ichor.—*Valsalva*, xxx. 4.

The colour imparted to the fluids evidently arose from morbid bile, united with other secretions in the stomach and intestines.*—*Morgagni*, 5.

* I have sometimes found the contents of the stomach of an extremely dark colour, owing to blood which appeared to have

The following case was communicated to me by Manfredi.

CASE 3.

Inflammation of the stomach, speedily fatal.

A man, whose occupation was that of a smith, went from home in the morning, complaining of slight pain in the stomach. The pain afterwards became extremely violent, and he vomited a fluid which resembled ink, and died before the evening.

Dissection. The stomach contained two pints of a fluid equally black, inodorous, and grumous. The inner coat of this viscus universally exhibited the same colour, and the greater part of the villous membrane of the duodenum presented the same appearance. The external coat of the stomach, facing the diaphragm, was occupied by a black spot four digits square; but though the outer and inner coats had this appearance, the middle coat was nowhere of a deeper colour than that of tobacco—a circumstance which surprised those who witnessed it.

Morgagni, xxx. 16.

This spot probably was of a gangrenous nature. The inner tunic of the stomach and of the duodenum might have been discoloured by the black fluid they contained, and that colour might have been derived from a mixture of bile, which was itself black, and of blood effused from the small vessels. Had it been mere extravasation of blood, death would not have occurred so speedily, even if the quantity had been much greater.—17.

been extravasated from the minute and turgid vessels of the villi. In a case of death from poisoning by opium this turgescence was so great, that blood exuded upon the handle of the scalpel by the slightest touch; and the whole surface was almost livid. This happened also, although not so extensively, in a case in which elaterium had been administered.—*Ed.*

CASE 4.

Inflammation in the mucous coat of the stomach, verging to sphacelation; the glands enlarged; central contraction of the gall-bladder.

A muscular man forty years of age, habituated to intense thought, had for some days been affected with headach, and ardor urinæ, when, one evening in the middle of August 1707, after having eaten a moderate supper, he was seized with violent pain in the region of the stomach. The pain in the head continued, and that of the stomach increased. A large quantity of green matter was discharged per anum, and also ejected by the mouth, and under these symptoms he died at Venice on the third day.

Dissection. When the stomach was opened, the right portion appeared in a healthy state, and numerous lenticular glands were developed. The left portion of this viscus was diversified at its fundus with vivid bloody spots; but some of them were coated with an appearance like rusty iron, indicating a tendency to gangrene. Even where there were no spots, and the internal coat appeared in a natural state, I could easily press out blood. At the distance of two or three digits from its fundus the gall-bladder was contracted, but was again dilated before it terminated in the cystic duct. This bladder appeared as if it had been divided into two.

The lungs adhered universally to the costal pleura and mediastinum.

There was no suspicion that either improper food or medicine had occasioned this lesion of the stomach.

Morgagni, xxix. 18

CASE 5.

Inflammation and central contraction of the stomach, with induration of the pancreas ; thickening of the coats of the gall-bladder ; disease in the heart and other organs.

A lady of rank at Padua, the mother of several children, and in her thirty-fourth year, began, whilst lying-in, to be annoyed with frequent vomiting. At the expiration of two months she threw up a globular body two inches in diameter, which was of a moderately soft consistence at first, but it acquired extreme hardness after being exposed to the air for three days. Although she was attended by several physicians the vomiting continued to the time of her death, which event did not happen till after the lapse of twenty-four years. Though a diversity of aliments was employed, the vomiting returned every morning, and two hours after dinner, and the matter thrown up was of a whitish colour, of a thick consistence, and glutinous. Whenever she attempted to repress the vomiting, she experienced great uneasiness in the region of the stomach till it returned, and the offending matter was thrown up. The vomiting was not accomplished without very considerable straining, but afterwards she was free from pain. There was no evacuation from the intestines except by means of purgative medicine. Chocolate was not only retained upon the stomach, but appeared pleasant and serviceable to it. When the region of this viscus, and indeed the whole abdomen, was examined by the hand, nothing unnatural could be discovered. About two years before death the pulse became intermittent.

Notwithstanding this complication of disease, the patient did not cease from her accustomed duties till

within the last month of her life, which she was constrained to pass chiefly in bed. At this time febrile symptoms arose, and increased every evening. The stomach was nauseated by every thing—even by the chocolate which previously had been so acceptable. The pulse was full, and also intermittent, as it had usually been. After taking some of the opening pills which she had been accustomed to use, violent palpitation of the heart came on, and though it was almost immediately allayed by withdrawing a few ounces of blood from the arm, yet it soon returned with violence, and was then mitigated by bleeding from the foot: yet this relief was not so decisive as to allow of decumbence on the left side afterwards. The surface of the blood was not incruusted. At the expiration of a few days, the bowels being again constipated, a gentle enema was injected: but this also induced palpitation, and no means that could be devised at this period, either prevented the vomiting or subdued the palpitation. Five days antecedent to death, (palpitation continuing,) the pulse became extremely feeble, slender, and creeping; and diarrhœa also came on—the dejections being frequent and in large quantity, though the fæces were indurated. When the hour of dissolution approached, she gave direction for her body to be examined after death, hoping, that if the cause of her protracted illness should be apparent, the discovery of it might be rendered of advantage to her children, with respect to an hereditary disease. For her mother, who had been dead many years, laboured under vomiting; and her daughter began to be affected with it. She died on the eighth of April 1744, and I was present at the dissection in the evening of the same day, in company with Peter de Marchettis, who, having attended this matron for twelve years, gave me the preceding narrative.

Dissection. The body was emaciated, although not to an extreme degree; and the limbs were free from œdema. The abdomen contained a considerable quantity of yellowish serum, and the omentum adhered to the peritoneum on the left side. The stomach was contracted, and near the antrum pylori the contraction was so much greater than in other parts, that the viscus appeared as if it had been divided into two cavities; and the mucous coat was of a red colour, as if from inflammation. This organ contained part of the water or broth which had been taken a short time before death, and likewise some portions of the viscid matter which she had been accustomed to vomit. The colour of the inner coat of the duodenum resembled that of the stomach. The pancreas was white and indurated, and exhibited no trace of succus pancreaticus. The whole of the spleen was of a pale colour, and also part of the surface of the liver. The parietes of the gall-bladder were thickened to a degree which exceeded any thing of the kind I had previously observed; and the cyst was full of black bile. All the intestines were greatly contracted, but especially the small intestines; and indeed, the excessive evacuation which preceded death would have led us to expect this circumstance.

Both cavities of the thorax contained a considerable quantity of bloody serum; and the pleuræ were connected together by thick and rather long membranous filaments. The pericardium adhered closely to the whole surface of the ventricles of the right auricle, and also to the surface of the large vessels pertaining to the heart: and the extreme border of the aortic valves was greatly thickened, and was of a cartilaginous hardness.

Morgagni, xxx. 7.

The nature of the organic lesion which had taken place in the heart has already been explained. The morbid state of the gall-bladder and of the pancreas probably gave rise to the vomiting. I might have supposed that the contracted state of the stomach had some influence in producing this affection, had I not observed the same structure in other women, who had not been subject to vomiting. Similar contractions, too, have been discovered by other anatomists in persons of both sexes; and sometimes the aperture of communication between the two portions of the stomach was exceedingly small. Doubtless, in the preceding case the contraction was congenital. The thickened condition of the gall-bladder would render it less susceptible of being excited to action; whilst it may easily be imagined, from the almost scirrhus state of the pancreas, how much less of the pancreatic juice would be secreted; and, it may be inferred, that the fluid which might be secreted would possess properties unfitting it for its usual purpose. Therefore from the deficiency of quantity, and from the morbid quality of the bile and of the pancreatic liquor, in conjunction with the diseased state of the duodenum, there would be a most imperfect elaboration of chyle. The coats of the duodenum also would be so irritated by the morbid secretions as to occasion inverted action; and the unnatural conformation of the stomach, neither favourable to digestion nor to the transmission of the chyme into the intestines, would probably conduce in some degree to the obstinate and protracted vomiting.*—8.

* This of course will not be considered an instance of acute inflammation of the stomach; and although the central contraction may have tended to derange the functions of this organ, I suspect that its morbid affections were not idiopathic. At first, perhaps, the functions only were perverted by sympathy; or they

CASE 6.

Scrofulous abscess in the parietes of the stomach, and in other parts; tubercles in the liver, and on the mitral valves.

A woman forty years of age, who had generally eaten salted provisions, and been accustomed to drink

may have been disordered by a more immediate relationship to other diseased viscera. The most urgent case of gastritis which has recently fallen under my care, arose from sympathy with the uterus. A lady, who had borne several children, had advanced to the third month of pregnancy, when pains in the hypogastric region, and other symptoms, indicated uterine irritation, and excited some fear of abortion. At the same time she became sick, but the vomiting was only occasional, and unattended with pain or tenderness in the epigastric region, or any tension of pulse. The vomiting, however, increased in frequency and violence every day, till the most unequivocal signs of acute inflammation were established. The pulse was quick and hard, the region of the stomach was extremely painful and exquisitely tender, and a deep inspiration occasioned violent pain in the stomach and right hypochondrium. Nausea was incessant, and vomiting very frequent. Actively depletive measures were adopted, and the blood withdrawn exhibited a buff and cupped surface. On the fourth day from the attack, the countenance was much distressed, there was extreme restlessness, and great prostration of strength; but as the symptoms of active disease were undiminished, no mitigation of the treatment was considered warrantable. Again she was copiously bled, and the next day there was evident amendment—the sense of prostration of strength, the sickness, the tenderness on pressure, and the oppression of respiration, had decidedly abated; but, occasionally, the vomiting was distressing. During the former period there had been an occasional recurrence of pains in the uterus, which now became more violent, and hæmorrhage commenced. The discharge returned at intervals, till the middle of the next day, the tenth from the onset, when abortion took place. At the time this circumstance happened there was profuse hæmorrhage; the countenance was exsanguis, the body was covered with cold perspiration, and the pulse was quick and feeble. An alteration of treatment now being indicated, the patient took some of the diffusible stimuli, with an opiate; and she was cautiously nursed, both as to quietude, diet,

good wine, had been for many years subject to pain of the stomach, accompanied with impaired appetite and with nausea; and these symptoms were soon accompanied with repeated vomiting of blood, continued fever, watchfulness, and thirst. When the abdomen was examined with the hand, no sensible hardness was discoverable; yet the region of the stomach was not, at times, quite free from uneasiness even from a slight degree of pressure, although, at that period, the more violent pain was not experienced. Sometimes a very protracted headach was united with the other symptoms. As often as the accession of gastric disease became most urgent, bleeding somewhat alleviated the symptoms; and drinking plentifully of water, in which nothing except a piece of bread had been boiled, was likewise of considerable benefit. She appeared more than once to have entirely recovered under the persevering employment of a milk diet; and every month her hopes were revived by menstruation, which continued regular to the termination of life. Not long before her death, a hard tumour appeared on each side above the clavicles, where the external jugular vein proceeds down the neck. The tumours, which were painful, augmented daily, and rendered breathing difficult. She had continued fever, with an evening exacerbation, attended, sometimes, with chilliness. She still complained of her head; and the pain in the stomach was constant; but at this time it was not accompanied

and ventilation. She scarcely experienced any sickness afterwards; and although her recovery was slow, she advanced progressively to her wonted health. At first I apprehend that there was sympathetic derangement of function, and then inflammation resulting from it; and although the acute symptoms had been greatly subdued before abortion, it was satisfactory to observe how completely the stomach was exonerated from morbid action after that event.—*Ed.*

with vomiting of blood. She was still thirsty, and perceived an intensely bitter taste; and the odour from her mouth was very offensive. Under these circumstances she dragged on existence longer than might have been expected.

Dissection. The emaciated body was brought into the anatomical theatre in February 1744. I found the omentum rolled up on the right side of the abdomen. The transverse arch of the colon lay a little below the navel, instead of immediately under the stomach, as it usually does. The whole external surface of the stomach was livid, but some parts were more deeply tinged than others; and the coats were greatly thickened and indurated, except in some places where they had become rotten, and might be lacerated with a touch. When they were ruptured, matter of a cineritious colour, of a soft pultaceous consistence, and very offensive odour, was effused. The posterior paries was excessively thickened, and internally it was not only tumid and unequal, but was in a foul and gangrenous state; and from this part, matter similar to that already described, had burst into the cavity of the stomach. The pylorus was in a natural state, and all the intestines were contracted, as might have been foreseen from the long abstinence from nutriment. The right part of the liver exhibited some roundish scirrhus tubercles, of a white colour, and about the size of small grapes. They were at a little distance from each other, and partially imbedded in the substance of the viscus; and one of them I found entirely within the substance. The gall-bladder contained a large quantity of yellow bile. There was a tendinous line upon the posterior surface of the left kidney, which penetrated its substance and resembled a cicatrix, but there was no relick of any former lesion in the adjacent parts.

The uterus was small, and low in the pelvis ; and was greatly inclined to the right side, in consequence of the round ligament being shorter on that side than on the opposite. The ovaria were large in proportion to the woman's age, and to the size of the uterus, and externally they were of a winding form. The fimbriated extremity of the right Fallopian tube was pervious, but the opposite was closed: whilst, on the contrary, the left tube was only open at the uterine extremity. Although an emaciated woman, there was a considerable quantity of fat in the mesentery and in the omentum, as well as in the interstices of the muscles. Some of the mesenteric glands, though not very hard, were enlarged and suppurated. The pancreas was somewhat thickened and indurated.

When the thorax was opened we found the two lower jugular glands enlarged so as to measure two digits in each direction. They constituted the tumour which had been perceived during life, and though of a hard texture they contained pus. The other jugular glands also were enlarged, and the bronchial glands were the size of grapes. They were of a blackish colour, and in a state of suppuration. The mitral valves of the heart were beset with numerous firm tubercles, of a roundish and depressed figure; and on one of the semilunar valves there existed a small scale, but it had not acquired a bony texture.

The cerebrum was slightly indurated, the lateral ventricles contained some pellucid serum, and the pineal gland was somewhat larger, firmer, and whiter than is usual to this body.—*Morgagni*, xxix. 12.

It seems probable that the commencement of this protracted disease was in some gland of the stomach, which gradually enlarged and became indurated; and by obstructing the circulation, the adjacent

vessels became loaded, and occasionally, they poured out blood. At length the gland suppurated and burst into the stomach; and it is easy to conceive what would have happened to the pancreas and liver, had the woman lived a little longer.

Other instances of tumours and abscesses in the parietes of the stomach may be found in the eighth section of the Sepulchretum, and also amongst the Monuments of the Cæsarean Academy, and in the works of Hoffman.—13.

I am indebted to Mediavia for the particulars of the following history:

CASE 7.

Enlarged glands in the stomach; scirrhus duodenum; indurated pancreas.

A monk who was a man of rank by inheritance, and equally noble in his manners, was cut off by a complication of diseases, but particularly by dropsy and vomiting.

Dissection. There was general anasarca, and the abdomen contained about two pints of a serous fluid. The liver and spleen were larger than usual, and the former of these viscera was pale and indurated, and its lobes were conspicuous. In the stomach there was nothing worthy of observation except a crowded plexus of glands, occupying a space four digits in length and two in breadth. They were situated at the bottom of the stomach near the pylorus, and were not quite the size of lentils, but their orifices were evident. About a digit below the pylorus the duodenum was black, and a little lower it was scirrhus. The pancreas was considerably indurated.

In both cavities of the thorax there was a considerable quantity of serous fluid, and the lungs

were collapsed. One of the valves of the heart exhibited a portion of bone. On the inner surface of the aorta, from the upper branches to the emulgent, there appeared the rudiments of ossification. Although he had been a man of tall stature, this artery was scarcely thicker than a finger of moderate size, and the other vessels were narrow in proportion.—*Morgagni*, xxx. 12.

Probably this narrowness of the vessels had been the primary cause of the other diseases; and I have no doubt that the hardness of the pancreas, and especially that of the duodenum, had occasioned the vomiting.—13.

CASE 8.

The parietes of the stomach scirrhus.

A man sixty years of age, and of a bilious temperament, had complained for many years of weakness and pain in the stomach. In process of time, a degree of induration was perceptible about that region, and below it one could feel some hard globular tubera, which were very moveable. The abdomen was tense, and when agitated it was evident that it contained fluid. There were frequent borborygmi and eructations. At the expiration of some hours after eating, vomiting sometimes occurred, although it had happened but seldom, during the first years of the disease. He voided but little urine, was thirsty, and complained of dryness of the tongue. His pulse was weak and small. At length, however, he discharged a large quantity of serous fluid by the urinary organs, and the tumefaction of the abdomen subsided, but the other symptoms daily acquired an increase of violence. The fluid vomited within the last month of the man's life presented the appearance of serum polluted with soot, and

exhaled an odour so offensive that he compared it with the smell of putrid flesh. His strength gradually decreased, his speech faltered, and he died.

Dissection. The abdomen contained one or two pints of bloody serum, and the omentum was contracted into tubera of various hues. The stomach was replete with a liquid similar to that which had been vomited. In a third portion of this viscus, towards the pylorus, the parietes were quite hard, and the pyloric orifice itself was so straitened that the chyme could scarcely be transmitted. Although the whole of this indurated part, when cut into, exhibited a white and solid texture, yet its inner surface, both in colour and feter, resembled putrid flesh, diversified with some bloody points.

Valsalva, xxix. 6.

The tubera which had been felt beneath the epigastric region, were evidently connected with the state of the omentum; and the upper induration was formed by the scirrhus of the stomach. As long as this disease did not extend to the pylorus, and consequently did not compress and diminish its aperture, frequent vomiting was not occasioned. The pain in the commencement of this organic lesion was slight, but when the coats had become more extensively scirrhus, and had advanced to a state of cancerous ulceration, the pain, of course, became more severe. Under this disorganization, and the imperfect digestion which resulted from it, we cannot be surprised at the other circumstances of the history, namely, the flatulence, the vomiting, the ascites, the debility, and, ultimately, the decease.*

Morgagni, xxix. 7.

* Morbid appearances resembling those which have been described in the preceding case were discovered on examining the body of the late distinguished exile at St. Helena. It is probable that in this extraordinary personage the disease origi-

CASE 9.

Carcinomatous tumour of the stomach.

A man about fifty-four years of age had observed his body wasting for five or six months, when, in

nated from mental causes. The vicissitudes of his eventful life, and especially the reverses attendant upon his later enterprises, must have enkindled passions uncongenial with the natural performance of the vital functions. To a man whose ambitious schemes were unbounded, nothing could be more deeply mortifying than banishment to a secluded spot. Here he could not but cherish the most poignant and humiliating reflection, and if the monotony of vexatious retrospection was interrupted, the variety would not unfrequently arise from depressing and irritating occurrences. Under these circumstances bodily health would inevitably suffer, and no organs are more dependent on mental influence than those which are subservient to digestion. The following is a copy of the official report, as it appeared in the daily journals.

“Report of appearances on dissection of the body of Napoleon Buonaparte.

“Longwood, St. Helena, May 6, 1821.

“On a superficial view the body appeared very fat, which state was confirmed by the first incision down its centre, where the fat was upwards of one inch and a half over the abdomen. On cutting through the cartilages of the ribs, and exposing the cavity of the thorax, a trifling adhesion of the left pleura was found to the pleura costalis; about three ounces of a reddish fluid were contained in the left cavity, and nearly eight ounces in the right. The lungs were quite sound; the pericardium was natural, and contained about an ounce of fluid. The heart was of its natural size, but thickly covered with fat; the auricles and ventricles exhibited nothing extraordinary except that the muscular parts appeared rather paler than natural. Upon opening the abdomen the omentum was found remarkably fat; and on exposing the stomach, that viscus was found the seat of extensive disease: strong adhesion connected the whole superior surface, particularly about the pyloric extremity, in the concave surface of the left lobe of the liver, and in separating these, an ulcer, which penetrated the coats of the stomach, was discovered, about one inch from the pylorus, sufficient to allow the passage of the little finger. The internal surface of

the beginning of August 1689, he became molested with vomiting, by which he threw up a fluid resembling sooty water; and a similar liquid was sometimes voided by stool. Scarcely any pain was perceived in the region of the stomach. At length the vomiting proved extremely urgent, with the excretion of the same matter as before. The pulse progressively languished, and the patient died on the thirteenth of November.

Dissection. All the limbs were flexible—a circumstance not often witnessed in the dead body. Near the pyloric orifice of the stomach there existed an ulcerated cancerous tumour, which appeared

the stomach, to nearly its whole extent, was a mass of cancerous disease, or scirrhus portions advancing to cancer; this was particularly noticed near the pylorus. The cardiac extremity, for a small space near the termination of the œsophagus, was the only part appearing in a healthy state. The stomach was found nearly filled with a large quantity of fluid resembling coffee grounds. The convex surface of the left lobe of the liver adhered to the diaphragm. With the exception of the adhesions occasioned by the disease in the stomach, no unhealthy appearance presented itself in the liver. The remainder of the abdominal viscera were in a healthy state. A slight peculiarity in the formation of the left kidney was observed."

The stomach is most frequently affected with scirrhus lesion towards its pyloric extremity, where the enlarged glands occasion an irregularly thickened and nodulated appearance. I possess a specimen of cancerous stomach which I took from the body of an old woman, in which preparation the coats surrounding the ulcer are nearly an inch in thickness. The ulcer was upwards of two inches in diameter. Its margin was irregular and callous, and where the ulcerative process shot beyond the boundary of the principal ulcer, destroying the villous coat, the border of this extended erosion also became thickened. At the bottom of the ulcer there were numerous sloughs, and in two places the coats of the stomach were totally destroyed to the extent of a finger's end. There had been no effusion, however, of the contents of the stomach; for the colon and a mass of omentum were consolidated with this part by means of adhesive inflammation. The stomach was contracted, the villous coat throughout was thickened, and its vascularity increased.—*Ed.*

to be constituted of a congeries of glands; and, on being pressed, it discharged matter like the *semen virile*. The stomach itself contained three pints of fluid, nearly the same as that which had been vomited. Betwixt the stomach and spleen there were two glandular bodies, the size of a bean; and, in their colour and texture, they were not very dissimilar to the tumour which has been described.

The right lung was somewhat inflamed on the posterior part, and serum issued from both lungs wherever they were cut into.—*Valsalva*, xxx. 2.

CASE 10.

Ulceration of the stomach, and tumour of the right ovary.

An old woman had been in this hospital for some months, on account of a tumour in the abdomen. About the umbilicus, and also below that part, the abdominal integuments were elevated; but the tumour inclined more to the right side than to the left, so that she was unable to lie upon the left side. The tumour was really large, but it appeared even larger than it was, from the circumstance that the hypochondria and most other parts of the abdomen had greatly subsided, from emaciation. It was very moveable when taken hold of by the hands, and gave but little pain. She constantly complained of an uneasy sensation in the stomach, with occasional nausea, but had no vomiting. Continued fever was united with the other symptoms, and there was no cessation of them to the close of life in October 1735.

Dissection. When the abdomen was laid open, it was evident that the tumour was constituted of the right ovarium, the cells of which were enlarged, and full of a soft though not fluid substance, of a cineritious colour inclining to yellow, without any offensive

odour. Its bulk was increased by the Fallopian tube on that side being consolidated with it, and having become greatly enlarged and thickened; whilst the uterus and its other appendages were in a natural state. The tumour was united to the contiguous side of the pelvis, and had contracted some adhesion to the nearest intestines, so that by their movements it might be somewhat moved also. The intestines were livid from inflammation, yet they exhaled no offensive odour.

The cavity of the stomach was contracted, and some parts of its inner surface were inflamed; and in the middle of the upper part of the stomach there was a superficial ulcer nearly of a circular figure, about three fingers breadth in diameter. Within this ulcer numerous lenticular glands, of a moderate size, were so obvious, that into the orifice of one of them I inserted a bristle. The ulcer was surrounded by a thickened edge, and the substance of the coats of the stomach, corresponding externally with the ulcer, was thicker and harder than at any other part. In the centre of the ulcer the coats were entirely perforated, so as nearly to admit the little finger; and the circumstance of no effused matter being discovered in the abdominal cavity, may be explained by supposing that the stomach had not undergone this extent of lesion till the woman was moribund, during which period the stomach was contracted, corrugated, and empty.

Morgagni, xxix. 14.

It does not always happen, even though circumstances seem favourable to it, that the contents of the stomach are effused when its coats are perforated. In a case related by Mercklin there was no effusion, although the ulcer was sufficiently large to admit the end of a man's thumb. Death had been preceded by many years of pain in that part, but

perhaps the opening had not been completed till a short time before death. In the Commentaries of the Academy of Sciences at Petersburg, a case of ulceration at the fundus of the stomach, from which there was no effusion, is recorded. The man appeared to have been consumptive, and died under constant vomiting. Tyson is said to have found the coats of the stomach perforated three times, and in one of these cases there was no escape of the contents. I do not here allude to those cases of perforation in which there is adhesion to the colon, and perhaps an opening into it; or to those in which the orifice is closed by agglutination with the liver; for under these circumstances no effusion into the abdomen could possibly happen.—15.

The cardinal Baronius was destroyed by irremediable nausea, which was found to have arisen from three ulcers in the mouth of the stomach. Other cases are on record of ulcerated tumours, of tubercles full of pus, of scirrhus affections, and of abscesses between the membranes, in which adhesion had been contracted with the colon, and a communication was opened between these viscera by means of an ulcerated foramen. Whenever the contents of the stomach have been effused into the abdomen, death has either speedily ensued, or has not been delayed beyond a few days.—16.

CASE 11.

Perforation of the stomach and of the abdominal parietes.

Peter de Marchettis read to me, from the letter of a neighbouring physician, the case of a woman who had a tumour in the region of the stomach, which her surgeon believed was advancing to supuration. However, the tumour disappeared, and

the skin contracted upon the spot so as to resemble a cicatrix, though no fluid had been discharged. The woman became pregnant, passed through the term of utero-gestation, and underwent parturition favourably. When three months had elapsed, she perceived that a little moisture oozed from the cicatrix, and on examination it proved to be some wine she had drunk. She also discovered that she could force out some pudding which had been eaten. The orifice, however, perfectly closed, and she continued to enjoy good health.—*Morgagni*, xxxvi. 31.

Wencker published an account of a woman in whose stomach an orifice remained open for twenty-seven years. Other cases may be found in the *Sepulchretum*.*—32.

CASE 12.

Ulceration of the stomach and œsophagus; the parietes of the left ventricle of the heart thickened; the aorta diseased, and the uterus inclined to one side.

A poor country woman apparently about fifty years of age, had been subject, at intervals, to a difficulty of breathing, united with a sense of constriction. The pulse was hard, and indeed the action of all the arteries was so powerful as to be observed by the eye, not only in the neck and temples but even in the hands. At a time when her respiration was extremely oppressed, she came to this hospital; and from the abstraction of a large quantity of blood, which was of a firm consistence, she was re-

* In these cases, the effusion of the contents of the stomach into the abdominal cavity was prevented by adhesive inflammation. Sometimes this process takes place between the ulcerated stomach and some of the contiguous viscera; at others, as in the preceding instances, between the stomach and abdominal parietes.—*Ed.*

lieved, and survived the attack four years. At the expiration of that period she was seized with pain in the stomach, and died in twenty-four hours. Her body was given me for the public lectures before the end of January 1737.

Dissection. The stomach was large and half full, and on opening it, we were surprised that its contents had not been ejected by vomiting. Its mucous coat was ulcerated in several places, and the ulcers appeared recent, and exhibited a gangrenous blackness. Near the pylorus they were minute and crowded, and in the fundus of the stomach they were larger and more dispersed; but at that part where the stomach begins to expand itself from the termination of the œsophagus, they were of a greater extent than at any other part. Nor was the œsophageal tube itself free from erosion. The disease seemed to have been occasioned by the ingesta, but we could not ascertain what had been their nature.

The spleen was somewhat enlarged and flabby. The uterus greatly inclined to the left side, consequently the round ligament was much shorter on that side than on the right. To one side of the cervix uteri a small and thick membrane of a pyramidal form, and of a white colour, adhered, and which I supposed to be the remains of an hydatid. The blood-vessels of the internal coat of the bladder, extending to the beginning of the urethra, were as turgid, and their inosculations as conspicuous, as if they had been injected. The mesentery abounded with fat, and the glands of this part were enlarged so that many of them equalled beans of a large size. The superior mesenteric artery originated in common with the cœliac; and the coronary artery of the stomach was much larger than usual.

Both cavities of the thorax contained a colourless fluid, and the pleuræ adhered together at the back and sides. The parietes of the left side of the heart were thicker than usual, whilst those of the right side were attenuated, yet there was no dilatation. The aortic valves were somewhat hard, and some parts of the trunk of this artery, by the yellowness and protuberance of the inner coat, indicated a tendency to ossification. The diameter of the left carotid artery exceeded that of the right; and bifurcated at scarcely the distance of an inch and half from its origin, which is an extraordinary circumstance. It was somewhat dilated where it began to divide, as were both the subclavian arteries at their division into the larger branches. The brain presented a natural appearance.*

Morgagni, xxix. 20.

The agitation of the arteries during life, their dilatations, and the rudiments of ossification in them, were partly ascribable to the thickened parietes of the left ventricle of the heart.—21.

Excrescences of the stomach.

In the observations of Hermannus and Basterus, either glandular or fungous excrescences of the pylorus were united with ulcers of that part, and appeared as if they had grown out of the ulcerated

* The coats of the stomach are sometimes found extensively perforated by the succus gastricus, and the appearance is liable to be mistaken for ulceration, or it may be ascribed to corrosive poisons. This occurrence was first noticed by John Hunter. It is not very likely to happen after a protracted illness, but a perfectly sudden death is by no means indispensable to its production. I found the fundus of the stomach very extensively destroyed from this cause, in a girl of a strumous diathesis, who died about eight and forty hours after being seized with convulsions.—*Ed.*

substance of the pylorus itself. All excrescences of the stomach, however, do not arise from an ulcerated surface. Verrucæ, as Paulinus termed them, and other fleshy tumours, have been found adhering to the coats of this viscus, where there has been no ulceration. Paulinus, in one case, found two of these tubera near the left orifice of the stomach, one of which was as large as a small apple, the other was the size of a large filbert. There was no appearance of ulceration, although the man had previously vomited a body equal to the size of an acorn, attended with considerable effusion of blood.

Morgagni, xxix. 16.

It cannot be denied, however, that these excrescences, and other unnatural appearances, some of which seem to have arisen in the same manner as *nævi materni*, may ulcerate or be broken off from accidental injuries. In one or two persons, and especially in an old man who died from a blow upon the head, I found a kind of membranous flap hanging from the ring of the pylorus, in so lacerated a state, that no doubt existed of its having been larger. At the same orifice I have also discovered protuberances like verrucæ, not pendulous. In the bodies of two men there were two enlarged glands the size of a vetch, situated in the pylorus. In one of them they were of a somewhat livid colour, in the other they were red. Their glandular structure was evinced in the latter case by a distinct development of their foramina; and the neighbouring glands of the antrum pylori were of a larger size than usual.*—17.

* Dr. Monro has given an excellent representation of a gastric polypus, which adhered to the villous coat by a neck. The surface of the tumour was smooth, and the body of it so firm, solid, and tough, that it was cut through with some difficulty. It occurred in a lady forty-five years of age, and the symptoms

It will appear from the preceding cases, that the pyloric extremity of the stomach is more frequently the seat of organic lesion than any other parts of this viscus.

The stomach was found ulcerated, and the pylorus contracted, on an occasion when unnatural appearances were supposed to have been occasioned by imperfectly prepared mercurial remedies, which had been administered for a venereal affection.—lxv. 3.

The coats of the stomach have been found thickened, and almost converted into a cartilaginous structure.—lxv. 2.

Central contraction of the stomach.

In one of the preceding cases the centre of the stomach was contracted. Indeed this constriction has been mentioned in former dissections, and will be distinguished in others. It has sometimes taken place to such a degree, that the aperture of communication between the two portions of the stomach was scarcely larger than the natural extent of the pylorus.*

were, pain in the epigastric region, indigestion, flatulence, diarrhœa, and emaciation.

Dr. Granville has described a similar occurrence in a female sixty-four years of age. She experienced chronic diarrhœa, marasmus, and complete adynamy. The tumour was attached near the cardiac orifice; it was cylindrical, six inches in length, and about an inch in diameter; and it was covered by the mucous membrane of which it was a prolongation. Its texture was dense and solid, and distinctly vascular.—*Med. Rep. Aug. 1817.—Ed.*

* Central contraction of the stomach is often met with; but, in general, it appears to be a temporary affection. In all the instances which have occurred to me it was instantly removed by inflation. Sometimes, however, it is permanent; and the aperture between the two portions has been found by others as small as Morgagni has represented it above. Sir E. Home and Dr. Monro have described this morbid appearance. In the *Med. Chir.*

CASE 13.

Prolapsus of the stomach.

The subject of this affection was a slender woman about forty years of age, who was extremely liable to violent paroxysms of hysteria, which convulsively agitated the whole body, but especially the abdominal viscera. At length, having undergone some accessions of extraordinary severity, she observed a manifest depression in the epigastric region, and fulness in the hypogastrium. There was uniformity in the state of emptiness of the former part, whilst the degree of fulness in the latter varied frequently in the day. At one period the tumefaction would be of a considerable size, and very hard, yet this repletion often dispersed suddenly. The woman perceived that the ingesta descended to the hypogastrium, which became more elevated. The sense of weight too, which always existed there, was augmented; and four or five hours after food had been received into the stomach, severe pains, accompanied with tormina and syncope, were produced. The sensation she experienced conveyed to her the idea that her viscera had fallen from their natural situation. The digestive powers were evidently impaired, she was feverish, and became greatly emaciated; yet, under these circumstances, her life was protracted for three months.

Dissection. According to my prediction the sto-

Journal for January 1816, Dr. Palmer has related a case in which the contraction was as perfect as if a tight ligature had been applied, and great difficulty was found in passing the little finger through the narrow ring which separated the cardiac and pyloric portions. The inner coat seemed healthy, except at the strictured part where the coats were thickened; and adjacent to it there were some spots resembling minute granulations.—*Ed.*

mach was found to have actually fallen into the hypogastric region, so that there was scarcely the space of four digits between it and the pubis. That part of the stomach corresponding with the œsophagus was elongated to such a degree, that even the whole fundus lay in the hypogastrium.

Valsalva, xxxix. 14.

The stomach may occupy the hypogastric region under different circumstances. In December, 1717, when dissecting the body of a woman, I found the stomach so capacious, that, although empty, the distance of the fundus from the pubis did not exceed the space intervening between these parts in the preceding instance. When the stomach is excessively distended with flatus, or from other contents, it has been observed to descend so far as to excite the idea of the patient being in an advanced stage of pregnancy, or labouring under ascites: but this rarely happens when the viscus is empty.

Occasionally some part of the stomach has occupied the hypogastrium, as well as other regions of the abdomen, not from an increase of magnitude, but in consequence of the descent of one extremity; or the whole may be forcibly drawn or pressed downwards. When the intestines have fallen into a hernial sac, the stomach has been dragged from its situation; and it has been forced into the lower part of the belly by a depression of the diaphragm, or by a greatly increased bulk of liver. *Ruysch* found the stomach and intestines in the hypogastric region of a woman who died asthmatic; but he has neither assigned a cause nor stated the inconveniences which resulted from this displacement. *Molinelli* has given the case of a woman in whom the commencement of the duodenum was closed by a large and firm tumour, and the magnitude of the stomach was so extraordinary that it descended to

the pubic region, and occupied nearly the whole hypogastrium. The patient had suffered the most difficult and protracted vomiting of food, and the body became emaciated and sallow. Although the pylorus was dragged lower than the other parts of the stomach by the weight of the tumour, there was an elongation of the œsophagus; so that whilst the viscus was enlarged by the lodgement of ingesta, it was also prolapsed.—*Morgagni*, 15.

If the case which fell under the observation of Valsalva is compared with these, its remarkable nature will be apparent. The stomach had been so drawn by the convulsive affection, and that part which is continued into the œsophagus had been so extenuated and elongated, that the fundus itself had descended into the hypogastrium. It is not unlikely that the œsophagus had also been somewhat lengthened. In the other instances alluded to, the displacement of the stomach was combined with lesion in some other organ; but in this, the prolapsus ventriculi was the only unnatural appearance.—16.

SECTION III.

DISEASES OF THE INTESTINES.

CASE 1.

Hæmorrhage from the intestines, with inflammation.

The subject of this case was a nobleman of Bologna, sixty-one years of age, who for many years had been afflicted with hemicrania, sometimes with erratic or fixed gout, and at others with renal calculi. He was invaded by an accession of podagra in the

right hand, but the part was not tumefied, nor severely painful; and as the sense of feeling became dull, the pain was scarcely perceived. The hand recovered, but the patient then suffered pain in the right kidney, accompanied with frequent but ineffectual retching. He obtained relief from this affection, but when the vomiting ceased, the gout attacked his right leg, in the calf and at the ankle joint of which, he experienced excruciating torture. After the lapse of one or two days the whole extremity of the foot was totally deprived of feeling and motion; but on the following day he had some consciousness of pain in the paralytic foot. After this he regained his wonted cheerfulness, and the pulse, which at other times was unequal and intermittent in the right arm, became natural. The day previous to death he vomited food mixed with a watery fluid, and felt slight pain with pulsation and heat, in the region of the stomach. Soon afterwards he twice vomited some yellow matter. He enjoyed but little rest that night, and the following morning complained exceedingly of thirst, of a disagreeable taste in the mouth, and of loss of appetite, all of which had considerably molested him from the beginning. The pain and pulsation in the region of the stomach continued, and he discharged blood per anum, with very cohesive and offensive matter like tar. He likewise perceived a sense of weight in the lower region of the abdomen, and some pain in the leg. Gradually he lost the power of moving the right arm, and the nails acquired a livid hue. A few hours before death he perceived a tremulous sensation in the præcordia. He died thirty-six hours after being attacked with pain in the bowels.

Dissection. The whole tract of intestines, from the stomach to the termination of the rectum, was horribly inflamed, so that not the least part was free

from lesion. They contained bloody matter like that which had been discharged. The stomach and kidneys were in a healthy state.

The posterior part of the lungs, especially on the right side, was slightly inflamed, and the pericardium contained a small quantity of fluid.

Valsalva, xxix. 10.

The pulsation remarked by Valsalva unquestionably arose from the accumulation of blood in the parietes of the intestines, whence it was effused into the canal; and to this case, perhaps, part of a prediction of Hippocrates may be applied: *circa ventrem palpitationes—sanguinis eruptionem significant.**

Morgagni, 11.

CASE 2.

Inflammation of the intestines, with extravasation of blood into the abdominal cavity.

Lælius Lælii, of Imola, a medical student, fond of solitude, and naturally of an irascible temper, was

* This case of hæmatemesis exhibits much more extended plethora of vessels than is generally found after the evacuation of blood from the alimentary canal. I have examined bodies after most profuse hæmorrhage, in which I have only found circumscribed plethora. Occasionally the turgescence has presented a somewhat stellated appearance, having radii tending to a centre, like the phænomena not unfrequently exhibited after the puncture of a leech. In such cases a species of hæmorrhagic action, which should be distinguished from inflammation, is kept up. It would have been more satisfactory if Valsalva had mentioned the condition of the liver in this gouty subject. In the case of a young lady, who died after profuse and repeated hæmorrhage from the alimentary canal, I found the liver of an unnatural solidity, of a yellow colour, and beset with minute tubercles. In the case of an old bacchanalian, who had vomited and purged bloody matter during some days before death, the whole liver was disorganized. In both cases the blood had been extravasated from the vessels of the stomach, without any appearance of ulceration.—*Ed.*

suddenly attacked in November 1705, about the fourth or fifth hour of the night, with pain in the umbilical region, but it was not uniformly violent in the same place. This seizure occurred at a time when he himself was enjoying good health, but was in hourly expectation of his father's decease. He soon began to vomit porracious bile, which, after a time, assumed an eruginous appearance; and, when dissolution approached, the bile became black. In the morning, about ten hours from the commencement of the attack, Valsalva visited him, and observed that the countenance was unpromising, the abdomen was tense, and likewise painful on pressure; the pulse was weak, and felt as if it were constricted; the urine was of a red colour, inclining to brown, and extremely turbid. Finding that such mischief had been so quickly effected, Valsalva predicted that he would die within twenty-four hours. He was twice bled, by the advice of two senior physicians, but expired the ensuing night.

Dissection. On opening the body about a pound and half of fluid blood was found extravasated into the abdominal cavity; and some blood was also effused into the bronchia. The abdominal viscera exhaled rather an offensive odour. A large portion of the intestines, especially at the upper part of the abdomen, was of a red colour, and the ileum began to assume a livid complexion. The peritoneum was marked, in several places, with black spots, especially where it invests the diaphragm; and the peritoneal coat of the stomach was unequal from what we should denominate black tubercles, rather than spots, which consisted of blood, or were the commencement of gangrene.—*Valsalva*, xxxv. 2.

Inflammation of the intestines is accompanied with no inconsiderable degree of spasm, and this is grea-

ter in proportion as the pain is more severe, whether the pain excites the spasm or is occasioned by it; and usually it bears some proportion to the rapidity of the progress to a fatal termination. Boerhaave having spoken of the exquisite sensibility of the intestines, from the multitude of their nerves, immediately refers to it in explanation of the celerity with which persons are sometimes destroyed by inflammation and ulceration of the intestines; so that if there be excessive violence of pain, the strongest man may be despatched within an hour. In violent pains of the intestines manifest symptoms of spasm frequently discover themselves. In no part of the body, perhaps, does inflammation more speedily degenerate into gangrene than when it invades the intestines; and this often occurs when the physician is not at all apprehensive of such a result.

Morgagni, 4, 5.

The following case was communicated to me by my preceptor Jacob Sandri.

CASE 3.

Inflammation of the intestines, preceded by pains resembling colic.

M. Cupellini laboured under an affection which was considered to be colic. He was in the act of taking a dose of an emulsion, when he suddenly expired.

Dissection. The whole body was examined, but no disease was discovered except inflammation of the intestinum colon, which verged to a black colour.—*Morgagni, xxxv. 8.*

CASE 4.

Inflammation of the intestines, speedily fatal.

A footman, short in stature though corpulent, be-

coming disqualified for the duties of servitude, begged his livelihood for some years, and drank plentifully of wine whenever he could obtain it. On the last day of his life he said he was unwell, and took nothing except bread and wine. Soon after taking this nourishment he complained of abdominal pain, and died about midnight. The body was brought into the anatomical theatre at the beginning of February 1736.

Dissection. As soon as the abdomen was opened the viscera exhaled an offensive odour, and a considerable part of the small intestines lay in the pelvis. Various parts of the small intestines were exceedingly narrow, and of a brown colour; but in other places they were red. The smallest vessels were so turgid with blood, that it appeared as if they had been injected. The same appearance was observable in several parts of the large intestines also, but especially at the caput coli. The edge of the liver was of a blackish colour. The spleen was enlarged, and the trunk of the abdominal aorta was not free from small ossifications.

Morgagni, xxxv. 10.

CASE 5.

Inflammation of the intestines, with abscesses of the omentum and mesentery.

A slender man, fifty years of age, after excessive fatigue in hunting, began to complain of extreme heat in the throat and chest. This sensation afterwards extended to the loins and abdomen, and the latter became so acutely painful that he could not bear its being touched. During the first days he was frequently seized with rigor; and five or six days before deathvolvulus came on, with the ejection

tion of feces. He died about the thirteenth day after decumbiture.

Dissection. The abdominal cavity was full of pus. The omentum and intestines were inflamed, and agglutinated together; and inflammation also occupied the liver and spleen. Blood was extravasated beneath the inner coat of the left kidney. In the omentum and on the edge of the mesentery, especially where it was connected with the colon, numerous small abscesses and ulcers existed.

Valsalva, xxxiv. 21.

When the abscesses began to form, not only was uneasiness experienced in the abdomen, but also in the loins, to which the mesentery is attached. The suppurative process was indicated by the frequent rigors; and the rupture of some of the abscesses filled the abdominal cavity with pus, and left the part in a state of ulceration.*—*Morgagni*, 22.

* Abscesses sometimes form among the abdominal viscera in a very insidious manner, of which the following case affords an example. Mr. T——m, about twenty-two years of age, and apparently of a scrofulous disposition, had laboured under dyspeptic symptoms for two months. The symptoms were, loss of appetite, pain and fulness in the abdomen after eating, debility, and a slight degree of fever. Being occupied in a small chemist's shop, and attempting to remove these affections by his own management, he, at length, took five grains of submuriatic hydrargyri, which, upon subsequent examination, was found not to have been finely levigated. This dose violently purged him, and from that period symptoms of acute abdominal disease were developed. I was consulted on the eighth of March, when he had fever, sickness, and pain in the bowels. The right groin and the penis were also painful; and in those parts he had previously felt uneasiness. The abdomen was tense and tender. On the tenth he appeared to be convalescent, and circumstances seemed auspicious till the twelfth, though he could not bear much pressure on the abdomen, especially in the right inguinal region. On the morning of the thirteenth, the pain in the groin and penis was extremely severe, and in the course of the day he experienced some difficulty of micturition, ap-

CASE 6.

Inflammation of the intestines, with effusion into the ventricles of the brain.

A man of a pallid complexion, about the same age as the subject of the preceding case, was seized with acute fever, two years before the illness of which I now more particularly speak. When the febrile symptoms subsided he experienced considerable thirst, with a sense of weakness in the head and stomach, and bodily languor. Under these circumstances he was attacked with oppression at the heart; and at night, when he began to fall asleep, the oppression was succeeded by tremor of the whole body. Some physicians supposed that

parently from spasm in the urethra. The abdominal pain he described as "drawing the bowels to the back." He died at three o'clock the following morning.

Dissection. The abdomen contained a considerable quantity of fluid, in which portions of coagulable lymph were suspended. The omentum was highly inflamed, especially at its lower border, and was adherent to the circumjacent parts. In the right groin the convolutions of the jejunum and ileum were, by adhesive inflammation, firmly united with the cœcum, and these parts included an abscess in which there were about five ounces of pus. The parts of the intestines forming the parietes of this abscess were abraded of their peritonæal coat. Some parts of the intestines were in a state approaching sphacelation.

In other cases in which I have known matter form in the abdomen, it has been the result of active inflammation. Here it apparently was the consequence of so slight a degree of increased action as to have been scarcely regarded. The excessively augmented action induced by the irritating mercurial preparation, seems to have brought on the acute symptoms. The affection of the urethra, which had been occasionally troublesome, though only in a slight degree before the accession of more active symptoms, was ascribable to irritation propagated thither in consequence of the right ureter being implicated in the inflamed and suppurated mass.—*Ed.*

he laboured under phthisis; but Valsalva attributed these symptoms to effusion of serum within the cranium. After having drunk wine to excess, violent wandering pain came on in the abdomen, accompanied with flatulence and bilious vomiting. On the following day the pain became fixed, and the part it occupied was exceedingly tender. As inflammation evidently existed, blood was abstracted; nevertheless he died on the fourth day.

Dissection. The greater part of the intestinum ileum was inflamed. There was a large quantity of serum within the cranium, and the ventricles of the brain were filled with a similar fluid. The glandules of the choroid plexuses were much enlarged, and abounded with serum, and the compages of the cerebrum was relaxed.—*Valsalva*, xxxiv. 23.

CASE 7.

Inflammation of the caput coli, with observations on volvulus.

A woman who, a year before, had injured her back by a fall, became affected with most excruciating and deep-seated pain in the abdomen, united with vomiting. After conflicting with these disorders for some days she was carried off.

Dissection. The stomach was surprisingly contracted, but the cæcum was so distended with yellow and semi-fluid excrement as, in capaciousness, to resemble the stomach. Inflammation had existed in this part of the intestine, and began to diffuse itself through the neighbouring viscera.

This case was communicated to me by M. Anthony Laurentio.—*Morgagni*, xxxiv. 27.

If the accident had any influence in producing this disease, it may be conjectured that the woman fell upon her back, and at the same time injured the

right side of the abdomen and that part of the colon which is situated there, so that its power of propelling the feces upwards having progressively decreased, the cæcum was at length dilated by their detention. If she had dragged on existence a little longer, probably she would have vomited excrement, or something which resembled it; for many persons, deceived by this similarity, have supposed that the matter which had passed into the large intestines was actually thrown up by vomiting in cases of volvulus. This circumstance, however, must happen much more rarely than is generally supposed, in consequence of the *valvula Bauhini*. It may be demonstrated that this deception has occurred; for in numerous cases, after death, the canal from the large to the small intestines was completely intercepted by the valve, though something like stercoraceous matter had been ejected. The ingesta which are conveyed downwards, with the *succus intestinalis*, the *succus pancreaticus*, and the bile, and are delayed in the small intestines, especially if the parietes of this canal are inflamed, acquire the peculiar odour of stercoraceous matter, and may be called excrement without impropriety.—23.

Notwithstanding the observations I have just made, it is unquestionable, however, that feces may be carried back from the colon, and ejected by vomiting. In cases of ileus, suppositories and enemata have been vomited; but respecting the way in which this occurs, different opinions have been entertained. It has been supposed that there must exist a state of plenitude both in the large and small intestines, by which the valve would be prevented from performing its office. Some have imagined that it must either be ruptured or paralytic, but this would scarcely be adequate to produce the effect. For though the valve may lose its power of contraction,

yet the frænum which is placed transversely on each side within the colon, tends increasingly to contract the orifice in proportion as this intestine is dilated. This advantage, I believe, often accrues from it, when, perhaps, there is a large quantity of matter accumulated in that part of the colon, and the abdominal muscles are in strong action to propel it. Ileus has appeared to arise from loss of the expulsive power, owing to an affection of the muscles of the abdomen and diaphragm: and it has also been ascribed to a state of atony of the intestinal canal.

There are several objections which may be urged against the proposed explanations. It is not possible to conceive that the intestines are in a distended state, or that they are even nearly filled, when enemata are vomited within an hour after they had been injected, without any great ejection of fecal matter. Another explanation must therefore be sought to explain how the clyster had been propelled from the rectum to the stomach, and by what means the valve had been kept open. In reference to the former of these points I see no reason to reject the opinion of inverted action. In some living animals, as the rabbit, a motion alternately anti-peristaltic has been noticed. Haller has not only produced examples of peristaltic but also of anti-peristaltic action, in the human body; and he quoted the authority of Wepfer, who observed both these actions in the human colon.—29, 31.

CASE 8.

Inflammation of the intestines and liver; adhesion between the pericardium and heart; membranous production in the uterus.

A poor woman, who was old and blind, as well as diminutive and slender, having been ill for three

days, was brought into the hospital at Padua, being supposed to labour under thoracic inflammation. At that time she was so exhausted that no information could be obtained from her, and she died on the day of admission.

Dissection. The intestines and liver were in a state of inflammation. The inner surface of the uterus was not less red than if she had recently menstruated, and the redness was ascribed to the same cause as the intestinal affection. At the part where the fundus of this organ contracted into the cervix, and where the anterior and posterior internal surfaces formed an angle at the right side, a preternatural membrane originated. It was not very small in extent, and passed transversely to the posterior surface, with which the whole inferior border united, but in other parts it was loose. This description shows that, contrary to the usual appearances of the valvula cervicis, it had its cavity turned upwards instead of downwards. I suspected it to have been the consequence of difficult parturition, as she had borne children. The pericardium adhered to the heart, though not very firmly; but it was not united to the large vessels. Its inner surface, where it had been conjoined to the heart, exhibited a white spot.—*Morgagni*, xxxv. 12.

Some of the preceding cases indicate how rapidly pain in the intestines may prove fatal, from the violence of inflammatory action, and even from spasm; and they point out the circumspection demanded from the physician during the urgency of this disease. He ought, however, to be still more cautious against being deceived into an unfounded hope of recovery by a delusive remission of disease, and sometimes an apparent cessation. The truth of this observation will be confirmed by the following instances.—13.

CASE 9.

Inflammation of the intestines, terminating in mortification; the spleen sphacelated.

A youth addicted to the abuse of wine and spirituous liquors, having laboured under intermittent fever not long before, was seized with pain in the abdomen, which was removed by a discharge of flatus per anum. It returned, however, in a few days, and on the sixth day from this recurrence he was brought into the hospital of St. Mary de Vita. The pain was seated in the hypogastrium, and was constant, though slight in degree. Sometimes its severity increased, and during these accessions of augmented pain, that region of the abdomen often became tumid; and on the hand being applied, inequalities resembling numerous hard balls were perceptible. The stomach also was painful, and he vomited both his aliment and medicine. Enemata of broths and decoctions of emollient herbs were injected, as well as linseed oil, and by this means alone, evacuations were obtained, but without any alleviation of the pain. When the patient sat up in bed he could endure the pain better than when decumbent, and he was most comfortable whilst the stomach was empty. On one occasion he vomited a lumbricus teres, but the absence of many symptoms of vermes forbade us to suppose that the pain arose from them. At length he began to retain some alimentary substances, but he was thirsty, and the abdomen was universally distended. It was now about the fifth day since his admission into the hospital; and he represented himself as having slightly amended—an opinion which was corroborated by his countenance, the cheerfulness of his conversation, and the improved strength of body. The pulse had never been un-

favourable, nor was it so at this period: at least there was no fever, nor had any been observed, unless, perhaps once, since he came into the hospital. Who would have believed, from these circumstances, that a fatal termination was at hand? Yet scarcely two hours had elapsed from the time when, in company with the students, I made these observations, before he suddenly began to cry out from the severity of pain. Vomiting also came on. In the evening his pulse was imperceptible. The pain continued till the ninth hour of the night, when he arose from bed for the purpose of a dejection; but he was attacked with syncope, and expired in half an hour.

Dissection. During the time persons were washing the body on the following day, a considerable quantity of a fetid liquid, the colour of tobacco, flowed from the mouth. It appeared to consist of putrescent blood, diluted with a stercoraceous fluid. In consequence of its escape, the hypogastric region of the abdomen became somewhat more flaccid; and though in the epigastric region, which was of a livid hue, and in other parts of the abdomen, there remained some distention, it was not so much so as during life. As soon as the scalpel penetrated the abdominal cavity, a large quantity of humour issued, which was similar to that which had escaped from the mouth. It appeared that the cavity had been filled with this fluid. All the small intestines were as black as charcoal; and part of the spleen was in the same state of sphacelation. The incredibly offensive odour compelled us to relinquish further investigation.—*Morgagni*, xxxv. 14.

It appears from this dissection to how great an extent disease had advanced at a period when the young man seemed to be convalescent. If it is supposed that this injury had taken place before he

came into the hospital, then it must have been concealed during five days, without those symptoms which usually indicate mortification; and if it took place afterwards, then the previous inflammation was not accompanied with the ordinary symptoms, especially continued fever. It was not certain whether stercoraceous fluid had escaped from the intestines in consequence of their rupture before death, or from a puncture during the dissection.—15.

I shall subjoin a lamentable case, in which there was not merely an abatement of pain, but its total cessation.

CASE 10.

Inflammation of the intestines and spleen, terminating in mortification : numerous calculi in the gall-bladder ; disease in the uterus and ovaria.

A slender woman, short in stature, of a bilious temperament, and about forty years of age, was liable to occasional hæmoptysis, which she attributed to a suppression of the menses for eight years. She came into the hospital Sancta Maria de Morte, at Bologna, about the beginning of March 1706, complaining of a cutting pain, which commenced under the left mamma, and extended to below the opposite, where, however, it was more slight. The pain was aggravated by pressure, and was accompanied with a difficulty of respiration. It commenced with rigor, of which there was a daily recurrence, though the fever was not of an intermitting type. Her face was florid, and her thirst troublesome; but she experienced more annoyance from cough, because it aggravated the pain. The sputum was often bloody, though at other times thick, white, and frothy. Occasionally she perceived a sensation as if something ascended to the throat: and had to endure what she described as

a gnawing pain in the umbilical region. The bowels were relaxed.

In the treatment of the case blood was withdrawn, and other remedies were administered ; and in a few days there was such an abatement of all the symptoms, that the physician pronounced her nearly well. She therefore arose from bed, but having become fatigued she returned to it, and was found there, drawing her limbs together from cold. The pulse was imperceptible ; but she reported herself to be exonerated from pain. On the same day she began to void dejections of fetid blood ; she had subsultus tendinum, and afterwards became delirious and died. This event happened on the sixteenth day from the commencement of her illness.

Dissection. As soon as the abdomen was opened, a fetid odour was exhaled like that usually emitted from sphacelated parts. Some lumbrici occupied the small intestines ; and these intestines were of a livid complexion—indeed they were almost black. The same colour was exhibited by the flat inferior surface of the spleen, and penetrated somewhat into its substance. The pancreas was thickened, and consisted of indurated globules. The liver also was a little firmer in structure than usual, and the gall-bladder was distended with calculi, and a little bile of a pale colour. The calculi amounted in number to a hundred and twenty. About twenty of the largest of them were, individually, the size of a filbert. The uterus was inclined to the right side, in consequence of the round ligament on this side being shorter than usual. At the point where the left Fallopian tube emerged from the uterus, there existed a pustule, the size of a lupine seed. The ovaries were contracted, and there were some vesicles in them. The coats of one of them were nearly cartilaginous.

The anterior surface of the lungs was, in a few

places, annexed to the costal pleura, by small filaments; and a portion of the right lung was slightly indurated. The heart was somewhat flaccid.

There was a redundance of fluid in the encephalon, and that which occupied the lateral ventricles was of a reddish colour. The choroid plexuses were rendered uneven by numerous hydatids, which were easily lacerated on being touched. The medullary substance exhibited numerous bloody points, and a large quantity of blood could be expressed from its sections.—*Morgagni*, xxxv. 16.

On reading the preceding narrative it will readily be conceived, that when the extreme remission of pain took place, without any critical evacuation, mortification of the bowels commenced; and this opinion is sanctioned by the circumstance that, on the same day the patient began to evacuate fetid blood. In medical practice nothing is more suspicious than the sudden cessation of pain, contrary to rational expectation.

I recollect that Peter Molinelli, a most sagacious and experienced physician, communicated to me a recent case of his own, which coincided with that of which I have just detailed the particulars. A young man, of a melancholic temperament, was seized with acute fever, accompanied with inflammation of the fauces and delirium. About the fourteenth day all the symptoms disappeared, except those of a febrile character; but though he perspired, and had copious micturition, yet the fever continued, with only a single day's intermission, till the thirty-fifth day. In consequence of this continued pyrexia, notwithstanding the plentiful daily perspiration, and the free evacuation of urine, Molinelli suspected the existence of some formidable though latent disease. At length, independently of any indiscretion, an eruginous diarrhœa suddenly came on, accompani-

ed with pain a little above the pubic region; and as these symptoms suddenly arose they vanished as abruptly. The whole abdomen became incredibly tense, with a sensation of internal heat; and pain was occasioned by pressure. The pulse was imperceptible, the mind wandered, respiration was oppressed, and death occurred on the third day from the time at which the abdominal tension was manifested. Permission to inspect the body could not be obtained, but no doubt was entertained respecting its being a case of inflammation on which gangrene supervened.--17.

CASE 11.

Inflammation of the intestines and stomach, terminating in mortification; a large biliary concretion.

A princess fifty-four years of age, who was exceedingly corpulent in the abdomen, but not in the limbs, had a remarkable irregularity in the pulse; for, after two natural pulsations an equal number followed which were weak and unequal. She had been attacked with violent pain in the intestines, accompanied with retention of urine, but she appeared so far convalescent that all pain had ceased. A few days afterwards, diarrhoea came on, and the evacuations were of a black colour. She died.

Dissection. The stomach and part of the intestines were found in a gangrenous state. The gall-bladder was dry, but occupied by a calculus the magnitude of a small pear. In the kidneys there were granules of sand. The heart and pericardium were loaded with fat.—*Morgagni*, xxxv. 18.

CASE 12.

Inflammation and sphacelation of the intestines and liver ; psoas abscess.

A man seventy-four years of age and addicted to wine, a month before I saw him began to walk in such a manner as to bear chiefly on his left leg. This circumstance, however, was more observable to his domestics than to himself, and he complained of no pain. Eighteen days afterwards he was seized with a wandering pain in the abdomen, but it was easily removed. Twelve days subsequent to this time he suffered oppressive and gnawing pain in the upper part of the right iliac region, which was tumid, and when lightly touched, it felt soft, but on pressing the hand rather deeply, induration was perceptible. The pulse was quick and frequent, the eyes were sunk, and the tongue dry. On the following day the pulse was full and vibrating; and the pain and tumefaction extended to the middle of the abdomen, and, at length, to the left side. Seven ounces of blood were withdrawn, which evolved no serum, but exhibited a yellow and thick crust. He experienced considerable nausea, but his dejections were easy. On the third day his pulse was depressed, and frequently he had eructations which were bitter and acid: his articulation was affected apparently from spasm, and occasionally he was delirious. On the fourth day his limbs were convulsed, and the whole body became rigid for a quarter of an hour. During the continuance of this convulsive affection and the rigidity, the pulse was imperceptible, but it afterwards regained the natural state, except being low and unresisting. Dyspnœa came on, with an increase of delirium; and he vomited feces, and died under convulsions the evening of the same day.

Dissection. The left lobe of the liver was flabby and entirely sphacelated. The stomach and intestines, especially the small intestines, were in some places red, in some livid, and in others black. The caput coli, and the contiguous muscles in the hollow of the os ilium, were affected with gangrene, and adhered together so firmly as to be inseparable without laceration. From this part matter, observed in the abdominal cavity, consisting of serum having a livid tinge, and pus, appeared to have been effused, as a similar fluid was contained in the intestines.

Morgagni, xxxiv. 25.

There is no great inconsistency in supposing that disease had first arisen in the muscles from which the neighbouring crural nerves were compressed, and hence the patient bore chiefly on the left leg in walking; and from the muscles it was propagated to the intestines.—26.

Chronic inflammation.

Instances are recorded in the Sepulchretum, and in other medical writings, in which the intestines had become sphacelated independent of preceding inflammation. This circumstance may occasionally happen, but it is worthy of inquiry whether the sphacelus might not have succeeded inflammation, the prominent and ordinary features of which did not discover themselves. Whilst discussing other subjects, it has occasionally been manifest that inflammation of the intestines had existed when there had either been no pain, or painful sensations were experienced only in a very slight degree: and fever, so far as it is denoted by a quick pulse and an elevated temperature of skin, has either been totally absent, or exceedingly moderate.*

Morgagni, xxxv. 20.

* We must be aware that lividness of colour is not sufficient

The deceptive appearances to which I have adverted occurred more than once to Valsalva and Albertini. The latter strongly inculcated upon me the necessity of vigilance and caution in pains of the intestines, because, after slight pain, without any manifest pyrexia, without spasm and vomiting, and while the powers of mind, and the strength of body, continued vigorous, he had known persons suddenly fall into the utmost peril, and indeed be quickly carried off, in consequence of a latent inflammation of these viscera degenerating into sphacelus. I inquired of him the symptoms by which to distinguish the impending danger, that we might be able, at least, to anticipate it. He referred to the pulse, to the abdomen, and to the face. The pulse, he said, in such cases, is low and rather weak, and if closely attended to, slight irregularity will be detected. The abdomen is tense, hard, and somewhat painful; and the face, though varying in different persons, has an unusual expression. Sometimes the eyes exhibit terror, and at others the circumference of the lips is livid. These, he said, were the general indications, but, occasionally, the patient is thirsty, and the appearance of his tongue unnatural. The truth of these remarks has often been verified by my own observation.—21.

Medical writers agree respecting the abdominal tension, but they add many other symptoms which clearly show the existence of enteritis. They allude, however, to that inflammation, the existence of which is easily ascertained, and not to the ob-

to determine that the intestines have actually sphacelated; for they not unfrequently present this appearance from congestion or extravasation of blood. Therefore it should be ascertained whether the coats of these viscera have lost their natural cohesiveness of texture, as well as their usual complexion, before they are pronounced in a state of mortification.—*Ed.*

scure affection of which I now speak, and of which very few entertain a suspicion. Van Swieten concurred with Simpson, a celebrated man, who, after giving a salutary caution to those practitioners who suppose that inflammation cannot exist without febrile symptoms, said—*Cum sæpe fixos dolores intestinorum et ventriculi inflammatio producat, licet nulla febris observetur, pulsu explorato.**—22.

* Morgagni has here given an account of sub-acute or chronic inflammation—a form of disease to which much attention ought to be directed, because its symptoms are often obscure and anomalous; and though its termination may not often be so melancholy as has been represented above, yet its effects are, in various ways, grievous, and full of peril. My attention was strongly drawn to affections of this nature a few years ago by some cases which fell under my care. One of them I have related at page 45. In that young man there had been chronic inflammation, and even suppuration, without any symptoms which awakened suspicion, till the disease was rendered acute by an irritating drug. Another instance occurred in the person of an amiable young woman, who by faithful servitude had obtained the confidence and affection of a respectable family in the country, that regarded neither expense nor sacrifice in promoting her recovery. When I was consulted she had been indisposed for seven months, and under the management of a respectable medical practitioner of this metropolis, who, I learned, had fully tried what mercury, strengthening medicine, and nutritive diet would avail. As a part of his plan of treatment she spent some time at Brighton, where the warm bath was of temporary advantage. Her symptoms were, pain in the epigastric region, furred tongue, slightly elevated temperature of skin, anorexia, and amenorrhœa. There were occasional circumscribed swellings in the abdomen, which she attributed to wind. They were accompanied with pain like cramp, and were most troublesome in the afternoon and evening. The bowels were irregular, although but seldom constipated; and the evacuations were of a pale colour. Her sleep was interrupted by disturbing dreams. The urine was deeply coloured, and voided scantily, so as to be about half the quantity of the liquid drank. The pulse was natural, but the general bodily strength was greatly reduced. She complained of the abdomen being rather distended with wind. At the first view of the case I considered it one of deranged function, and prescribed an alterative dose of the pilula hydrargyri, with

In dysentery a similar abrupt cessation of pain sometimes occurs previous to the supervention of gangrene,

the daily use of a light tonic. The general health was a little amended, but the abdominal disease was nearly stationary. Two powders, each containing three grains of hydr. subm. and one scruple of jalapium, were recommended to be taken three days apart: but the effect of them, as well as a previous observation that on pressing the abdomen firmly it was both tense and tender, led me to relinquish my first opinion of the case. She reported that the first powder acted freely on the bowels, the stools at first were yellow, but afterwards green and slimy, and she felt "lighter and more comfortable, and the lumps, though as hard as before, were more scattered." But on the second day she had an increase of pain, especially in the rectum and in the loins. Two days after taking the second powder she wrote to inform me, that it did not act on the bowels, "but" to cite her own expressions, "it made me so full and uncomfortable that I did not know what to do; and I still feel very ill from fullness of the bowels: the quantity of water has a little increased, but I feel a very unpleasant sensation after making it." Upon very close investigation I found, that after taking even the blue pill there had been a temporary increase of symptoms the next day. Except when under the excitement of the powders, or of some other stimulation, the pulse did not exceed eighty or eighty-five, and was moderately soft; and there was no continued abdominal pain. I now felt confident in steering another course; and consequently directed the application of ten leeches to the abdomen, and a blister when the orifices had ceased bleeding. The only medicine administered was an oil of almond emulsion, with a few drops of tinctura opii, and an occasional dose of castor oil. I directed also that the diet should consist exclusively of milk, vegetables, and light puddings. Five days afterwards she reported herself much better; she was therefore directed to repeat the leeches and blister, and to continue the total abstinence from every preparation of animal food. At the expiration of a fortnight she had some intimations of approaching menstruation, which I endeavoured to promote by the warm bath, and, at other times, by warm fomentations applied to the loins and abdomen. This plan was successful, and the menses flowed copiously, but accompanied, as usual in her, with slight fever. A few days afterwards I found that all abdominal tenderness and tension had vanished, but she had an occasional attack of cramp in the abdomen as before, though the intervals were now very distant. The dejections were still white, and only obtained after taking castor oil. I

We must be careful, however, not to adopt the opinion that cessation of pain is a universal precursor of mortification of the intestines. The case

now admitted a little broth to the diet list. The same medicines were continued, but the leeches and blistering were not repeated; and at the termination of a week I found her in a state of advanced convalescence, with scarcely any abdominal uneasiness, and the abdomen sunk to its proper size. The quantity of urinary secretion was fully equivalent to the fluids she drank; the alvine excretions were of a natural colour; the countenance was fully relieved of anxiety, and the strength was rapidly increasing. Five grains of blue pill every third night, with a little infusum calumbæ twice a day, and a cautiously improved system of diet, completed the recovery.

If I have been prolix on this case it is because I conceive it elucidates a principle of vast importance, namely, that there may exist inflammatory action when there are scarcely any other symptoms than those of dyspepsia; though, indeed, this fundamental truth has been distinctly asserted by Morgagni. Many such cases have occurred to me, and though, as in the preceding instance, the functions of the liver and of other organs were suspended, it was in vain to attempt their restoration till inflammation was subdued. The secretion of the liver, in such circumstances, will not be restored by mercury, nor that of the kidneys by diuretics; but when, by appropriate and persevering depletion, the inflammation is subdued, every organ either spontaneously returns to its natural duty, or is easily solicited. It was interesting to observe, that whilst even the mildest preparations of mercury were somewhat irritating, and larger doses decidedly injurious, as soon as inflammatory action was overcome the secretions of the liver became healthy, and the functions of the kidneys and uterus were at once recovered.

There is a particular seat of erythema of the mucous coat of the intestines to which I shall just advert, because it often modifies the symptoms of disease with which it may be associated. Upon various occasions when there existed some abdominal lesion, I had observed a bilious diarrhœa come on, though it did not appear to be connected with disease in the liver, nor was it ascribable to any of the ordinary causes of purging; and I had an opportunity of ascertaining, by a post mortem examination, that the inner coat of the duodenum, about the termination of the biliary duct, was highly inflamed, without the least evidence of hepatic disease. I have seen other cases, in which I had no doubt the liver was excited to

of the young man related in this section* is one amongst others which indicate the contrary. During the last fifteen hours of his life he cried out in-

a redundant secretion by irritation propagated thither, through the ductus choledochus, from an inflamed duodenum. There was no pain or tenderness in the region of the liver, but the epigastrium was tender, and the whole abdomen was a little tense. There was considerable rumbling in the bowels, a frequent dejection of almost pure bile, and occasional vomiting. The pulse was frequent, rather contracted, and soft. I found that nothing removed the diarrhœa promptly and effectually except bleeding. Affections ascribed to the liver probably arise more frequently from the duodenum than we are aware of. I shall only glance at a case of puerperal peritonitis, in which I believe the circumstances to which I have adverted tended to obscure the actual state of disease. On the first of March I was called upon to meet a medical gentleman in consultation upon what was termed a bilious affection after parturition. I found the lady had been confined a week, and during four or five days she had been distressed with excessive purging, and occasional vomiting of bile, attended with violent pain in the epigastric region. The pulse was a hundred and forty, and feeble; the countenance was deeply distressed, and the lips and hands were livid. She complained of dyspnœa, and begged for air. The abdomen was tumid and tender, and the tongue white. I considered it an unequivocal case of peritoneal inflammation, and assured the friends that she could not survive the day. To the medical gentleman I ventured to predict, that the mucous coat of the duodenum was inflamed as well as the peritoneum.

Dissection. The abdomen was tumid. The peritoneum investing the muscles, as well as covering the intestines, was highly inflamed, especially throughout the ileum. Coagulable lymph had been effused, and adhesions formed in consequence; and certainly in this case there was slight inflammation of the peritoneal coat of the liver. The mucous coat at the pyloric extremity of the stomach, and for some inches within the duodenum, was considerably inflamed, as I had anticipated; and from attentive investigation, I believe that in this case, as well as in the others to which an allusion has been made, the appearance in the duodenum was the cause of hepatic excitation.

Ed.

* Vide page 52.

cessantly from excruciating pain; nevertheless the greater part of his intestines was as black as possible. Acute inflammation may affect the parts not implicated in the process of mortification, or there may exist some other cause of pain, as spasm or worms. In some of these patients, which others as well as myself have examined, calculi were found in the gall-bladder; but whether the coincidence was accidental or not I leave others to determine.

When discharges of black matter by stool are united with a cessation of pain, the occurrence must be associated with the most alarming symptoms, and those which intimate the approach of death. With this observation I must unite the circumstances mentioned concerning a nobleman;* not, indeed, as being conjoined with pain in the intestines, for in consequence of their paralysis they had not become painful; but as being connected with violent inflammation in the whole of these viscera.—23.

CASE 13.

A tumour formed by adhesion of the small intestines, from chronic inflammation of the peritoneal coat; the coats of the stomach thickened and tuberculated; the omentum consolidated.

Fortunato Maurocini, a bishop of sedentary and studious habits, gradually became the subject of hypochondriacal affections, and of hæmorrhage from the hæmorrhoidal vessels. Whilst the loss of blood continued to be in a moderate proportion he enjoyed good health, although there was considerable obesity of the whole body, and especially of the abdomen.

* Vide page 40.

As he advanced in years the discharge of blood diminished, and he began to be annoyed with pains in the abdomen, which he attributed to flatus. Frequently they were sudden and momentary, but sometimes they were of a rather more protracted duration. When he had completed his sixtieth year the hæmorrhoidal bleeding ceased, and the pains became more troublesome, especially in the autumn of 1726, at which time he frequently experienced febrile affections. He was relieved from the latter by peruvian bark, and the pain was alleviated by the seasonable return of a discharge of blood. The fever, as well as the pains, having arisen again the following winter, they were mitigated by the same means, but never perfectly removed; and it was in this winter that he first perceived some hardness and a tumour in the abdomen. His bowels were constipated, vomiting became exceedingly troublesome, and if he did retain any food for a considerable time, it at length came up unaltered. This was actually the case with a boiled apple, which had remained in the stomach for eight and forty hours. Besides food, the stomach ejected a considerable quantity of a colourless and insipid watery fluid; indeed its quantity exceeded that of the liquids which he drank. In this stage of the disease I was consulted, with two other physicians. We found that he had been confined to bed for some days, his face and limbs were emaciated, his pulse was frequent, but the temperature of the body was natural. We were informed that the frequency of the pulse increased towards evening and in the night.

The tumour which has been mentioned was perceptible to the eye. Its form was nearly circular, and its diameter eight digits. The abdomen being extremely prominent, the tumour was situated midway between the cartilago ensiformis and the umbili-

cus. On examination with the hand, it was perceived to be unequally tuberoso, and on being compressed, or on the viscera becoming distended with flatus, a painful sensation was excited, though not in a violent degree; but, at other times, slight uneasiness was experienced. By taking hold of the tumour with both hands I could easily move it to either side. No pain arose from pressing the circumjacent parts.

Morgagni, xxxix. 21.

There was great diversity of sentiment as to the precise situation of the tumour, but we united in opinion that it was incurable, and that our efforts should only be directed to the palliation of symptoms and the prolongation of life. Consequently we advised that all irritating and unpleasant medicines should be avoided, and also those articles of diet to which the patient felt a repugnance. Purgatives in general, except rhubarb, produced considerable uneasiness: we therefore recommended him to keep the bowels open with that medicine, to lose a little blood occasionally from the hæmorrhoidal vessels, and to select such food as remained longest on the stomach.—22, 23.

The symptoms gradually became worse, and, in June following he was seized with subsultus tendinum, and occasionally betrayed a wandering of intellect. Vomiting continued, and the matter ejected had a bitter taste, and exhaled an offensive odour. Its colour, too, was so black, that some persons supposed it to be blood, but a piece of paper dipped in it and dried exhibited a pale yellow colour, verging to green. On the twenty-fourth of this month he was assaulted with so violent a paroxysm that his decease was apprehended; and about the same hour of the ensuing day he had a similar attack, under which he placidly expired.—25.

In the evening of the same day the body was opened for the purpose of being embalmed.

Dissection. The fat upon the abdomen was two digits in thickness; and about three pints of bloody serum were contained in the abdominal cavity. The figure of the large tumour, about which there had been so much controversy, was between that of a globe and a hemisphere, and it resembled a foul carcinomatous mass in its colour, and in the odour it exhaled, as well as in the inequality of its surface. The whole space below the umbilicus was destitute of viscera except the inferior part of the descending colon and the rectum, from which circumstance we immediately understood what the nature of the tumour really was. The whole intestinum ileum, and some part of the neighbouring jejunum, having been drawn upwards, and the convolutions having contracted very close adhesions, constituted this prominent tumour, without any addition of scrofulous, scirrhus, or cancerous substance. The unevenness of the surface was occasioned by the numerous flexures of the intestines, and their alternate constriction and protuberance. With the exception of some portions which were still red, the general complexion of the tumour was black; which circumstance, with the fetor rising from it, indicated that inflammation had degenerated in sphacelus. The intestines of which the mass was composed were nearly filled with a substance which resembled the stercoraceous matter usually occupying the large intestines, and not very soft in its consistence. It was therefore evident that the matter which naturally descends very speedily into the large intestines, combined with gas, being obstructed, the tumour might afford that resistance to the touch which had been perceived in the living body. The adhesions between the convolutions in the centre, and at the upper part of this congeries of intestines, was not so firm as in the circumference. The mesentery was in a perfectly

healthy state, and filled with fat, which, as usual, was of a pale yellow colour.

The omentum was folded up and lay totally concealed between the stomach and tumour. It formed a hard and thick roll, closely attached to the fundus of the stomach and to the transverse arch of the colon, passing transversely from one hypochondrium to the other, and depressing the viscera to which it adhered by its ponderousness. In different places it was from one to three digits in thickness, and the thickest portion was contiguous to the spleen, where it was of such inflexible solidity, that on being cut into, it grated under the knife. Although there was uniformity in the appearance of its texture, yet whilst some parts were of a ligamentous firmness, others were nearly as hard as cartilage.

The contents of the stomach resembled the fluid which had been vomited—they were blackish, and exceedingly offensive in smell. The inner surface of this organ appeared of a brownish-red colour, which, perhaps, it had derived from the humour contained in the stomach, or it might have been the result of inflammation. Within the antrum pylori we discovered some spots which at first sight appeared to be coagula of blood, but on more attentive examination they proved to be small and depressed tubercles. Their internal texture was white and firm, but the surface of them was gangrenous. Some were of an oval figure, but most of them were constituted of many smaller tubercles, so as to give them a radiated appearance. The largest was scarcely equal to the magnitude of a bean. As they approached the pyloric orifice from the antrum, their size and number decreased, so that at length there was but a solitary tubercle. Within the pylorus itself there were neither tubercles nor excrescences; nor was the orifice so contracted as to

prevent the introduction of my finger, though the coats in this aperture, as well as through the whole pylorus, and at the commencement of the duodenum, were equal in thickness to the apex of the little finger, and resembled the omentum in appearance and hardness. Out of this compact texture the tubercles which I have described arose.

The liver was pale and somewhat indurated, and the gall-bladder contained bile resembling a blackish scum. The pancreas was somewhat diseased, but the rest of the viscera in the abdomen, and all the viscera of the thorax, were healthy.—26.

It is a circumstance worthy of remembrance, that in this case a tumour constituted of the intestines so greatly resembled scirrhus in its tuberosity and resisting surface, that five intelligent and experienced physicians were deceived.

In the Transactions of the Cæsarean Academy, and in the Sepulchretum, I have read of the convolutions of the intestines being agglutinated to one another, and also adherent to the mesentery, so as to form conglobate masses; but in none of those instances did the cohering parts present externally a distinct and circumscribed tumefaction. In two of them, indeed, this could not have happened, because the morbid adhesions were coexistent with ascites. In a dropsical woman Thomas Bartholin found all the intestines forced into the right hypochondrium; and Laubius discovered them collected into a globular heap in the umbilical region. In Cardinal Campegio, Columbus found that all the intestines, except part of the colon and the rectum, had been removed from their natural situation into the hypochondria, so that, with the exception just named, the inferior part of the abdomen was destitute of intestines, and, as in the bishop whose case I have just described, the spine was uncovered.

I afterwards met with a more extraordinary occurrence of this nature in the body of a female foetus ; for on opening the belly and wiping away the blood which had been extravasated there, no intestine could be perceived besides part of the colon and the rectum. The remainder, with nearly the whole of the mesentery, were concealed and confined under the concave surface of the liver. Nobody would have suspected the real state of these viscera, because, in consequence of the extravasated blood, the abdomen did not subside below the umbilicus ; and if it had done so, the circumstance would have been ascribed to the prominence of the liver, which is always large in the foetus ; and in such a case as this, probably it would have been considered enlarged.

In the bishop I did not examine that part of the abdomen which is below the navel, during life, because the attending physicians assured me that every thing was perfectly natural in that part ; and probably the excessive quantity of fat would have prevented the discovery of the exact state of things. But when there is not so great an accumulation of fatty substance in the abdominal integuments, the facility of feeling the vertebræ, and the pulsations of the aorta when there is no suspicion of its being dilated, are circumstances which in the diagnosis may not be without advantage, especially if we find the abdomen unnaturally depressed below the umbilicus, and proportionately more tumid above it. In attempting to distinguish tumours formed by adhesions of the intestines from those which are carcinomatous or strumous, the signs to which I have adverted will be strengthened by an inquiry into other symptoms. If the patient has frequently suffered pains in the small intestines, and the bowels have become costive—if there has been repeated hæmorrhage from the hæmorrhoidal vessels—if the tumour is particularly affected with

pain when the intestines are distended with gas—and if it varies in its size and firmness, like intestinal herniæ, we may infer that the tumefaction is occasioned by these viscera.—28.

Although in the following case the disease was complicated, yet it has some relation to tumours formed as those were on which I have more particularly dwelt. I did not see the patient myself, however, and therefore I cannot answer for its being accurately described.

CASE 14.

A monk of the monastery of St. Francisco, in my native place, having indications of slight ascites, appeared to have suddenly evacuated the abdomen by copious vomiting. In the hypogastric region, however, a tumour was perceptible, which was so hard as to induce those who attended the patient to consider it scirrhus. When it was compressed with the hands, flatus was expelled downwards. The vomiting continued, and was conjoined with constant and excessive nausea, and insuperable costiveness. At length, feces, or, at least, matter resembling the alvine excretion, was thrown up; and although no pain had been felt in the abdomen, nor had any signs of inflammatory action come on, yet the patient was carried off by the disease on the fifth of November 1709.

The physician who had attended the patient, and who communicated the preceding information, requested me to preside at the dissection; but at that time I was unwell, and therefore desired him to superintend the examination, and to favour me with the particulars. He complied with my request, and brought the report on the following day.

Dissection. The intestines were extremely livid,

but not rotten. The convolutions of a part of the small intestines were surprisingly entangled, and were connected together by a firm and dense substance, which resembled tendon—indeed it was almost of a cartilaginous texture : and these adhering parts constituted the tumour. The hardness which it had acquired was not only derived from the connecting substance, but also from balls of indurated feces. Globular masses of the stercoraceous matter also existed in the continuous colon ; and for some extent, near the termination in the rectum, this intestine was rendered impervious. The stomach was filled with a dark-coloured fluid, and its inner coat was of a slightly livid hue.—*Morgagni*, xxxix. 29.

Adhesion of the intestines to each other, and to the peritoneum, without being drawn from their natural situation, is not an unfrequent consequence of inflammation ; and is a morbid appearance often observed in cases of ascites.—30.

Persons who are subject to pain in the intestines, especially if it is united with spasmodic affections, are peculiarly liable to a displacement of these viscera.—31.

The union of the intestines by a kind of cartilaginous substance does not surprise me, because Valsalva and myself have observed this medium of attachment after ascites. Indeed the peritoneum itself, a production of which constitutes the external coat of the intestines, may, in dropsical subjects, become very thick, and, in process of time, acquire a cartilaginous hardness. Paul Barbette reminds us that it is necessary to bear this circumstance in mind in performing paracentesis abdominis. Occasionally too, the intestines adhere together by firm bands of this nature, independent of any ascitic effusion ; and their coats sometimes become so thickened that the caliber is nearly obliterated.—32.

gang

CASE 15.

Ulceration of the intestines, with flaccidity of the heart.

The young man to whom the following particulars refer had always been subject to relaxed bowels, even when in the enjoyment of perfect health. Having attained his twentieth year he was seized with tormina, accompanied with frequent dejections of blood, so that, in fact, he laboured under dysentery. When about twelve or fifteen days had elapsed, the disease assumed the form of simple diarrhœa, with yellow evacuations; and it was unattended with pain. The purging appeared to be somewhat checked by the remedies employed, when an attack of tertian fever manifested itself, which, however, was removed within a month. Some diarrhœa continuing, he was suddenly affected with acute fever, which had distinct accessions; and his pulse was frequent and quick, as well as small and feeble. To these symptoms dulness of intellect and considerable deafness were added; and a remarkable swelling was noticed on the anterior part of the left side of the thorax. He died about the fourteenth day from the commencement of acute symptoms.

Dissection. Although there had existed no tumefaction of the abdomen, yet this cavity contained a considerable quantity of sanious ichor which had escaped from the perforated intestines. The parts in which ulceration had taken place were the extremity of the ileum, and the contiguous portion of the colon, to the extent of two spans; and the inner surface of this tract was gangrenous, and consequently might easily be perforated. Some of the adjacent mesenteric glands were enlarged, and formed a tumour which contained a purulent fluid similar to that which had been effused into the abdomen. The

substance of the tumour was soft and flaccid. The spleen was enlarged to three times its natural bulk.

The swelling upon the chest consisted of an accumulation of serum in the cellular substance about the pectoral and subclavian muscles; and when that substance was divided, the fluid issued in several small streams. The lungs were healthy. - The pericardium contained some bloody serum, and the heart was so flaccid that on being handled it felt rather of a membranous texture than muscular. The ventricles contained fluid blood; and this was so frothy that, when agitated, it resembled the lixivium used by barbers. The veins contained but little blood, but all of them were exceedingly turgid with gas; and one which belonged to the spleen, though having scarcely any blood in it, was dilated to the utmost degree. A small quantity of serous fluid had been effused into the brain.—*Valsalva*, xxxi. 2.

The gas had been extricated during the process of putrefaction. The flabbiness of the heart accounted for the arterial pulsation being small and feeble. The spleen I have frequently observed to be enlarged after fevers which have been protracted in duration, and which have varied in their type. But the chief object of the preceding narrative was the state of the bowels, in which there had been a natural tendency to redundant and vitiated secretion, and upon that state ulceration supervened. Morbid matter being absorbed by the lacteals, and conveyed into the neighbouring glands, disease was excited in them, and they became obstructed and enlarged.

Morgagni, 13.

When this had taken place a new source of increased intestinal flux was established, because less of the alimentary matter traversing the intestines could be absorbed. When obstructions of this nature exist, they not only tend to increase diarrhœa if it previously

existed, but they may produce it. The chyle itself blended with recrementitious matter is discharged, and the dejections are nearly of a cineritious colour.*
—14.

* Ulceration usually commences in the villous coat of the large intestines; and when this coat of the small intestines is the seat of ulceration, I believe that it most frequently occurs in the ileum, near its termination in the caput coli, where I have repeatedly found it. Dr. Baillie states that he had not met with an instance in which the ulcer began on the outer surface and spread inwardly. Not unfrequently, however, it extends from the inner coat, and perforates the peritoneal. When this takes place it does not necessarily follow that the contents of the intestines are effused into the abdomen, for most frequently the ulcerated part is united with some contiguous viscus or with the peritoneum, by adhesive inflammation. In a case of annular contraction of the descending colon, combined with extensive ulceration, by which all the coats, in one place, were destroyed, I found that the escape of fecal matter was prevented by consolidation with one of the fatty appendages. Sometimes there has been communication between different portions of intestine, in consequence of this adhesion and ulceration.

The symptoms of inflammation and ulceration in the mucous coat of the intestines are sometimes exceedingly obscure. At the onset, in the following case, they rather indicated a pulmonary affection.

On the first of September 1813 I was requested to see a gentleman about forty-five years of age—a remarkable strong and healthy man. A few days before, having experienced considerable giddiness, he was cupped, and by that means obtained relief. I found his respiration very quick, and he articulated with unusual haste, though he was unconscious of any difficulty of speaking. He had neither pain in the thorax, nor inability to make a deep inspiration, yet he was sensible of some oppression at the chest. His tongue was a little white, his pulse was a hundred, and rather full; and he had slight anorexia. His bowels were relaxed, and he micturated freely. The blood which was repeatedly withdrawn, presented a firm and cupped surface. The breathing had become more natural, but on the sixth the dyspnœa increased, and every morning he had an accession of diarrhœa accompanied with tormina. He had considerable flatulence, and slight tumefaction of the abdomen. The stools were liquid and of a deep yellow colour, and the difficulty of respiration was most urgent at the time of the purg-

Celsus entertained the opinion that in dysentery the villous coat of the intestines was in a state of ulceration. Sometimes he noticed a kind of mucous secretion voided with the blood, and at others, por-

ing. A most intelligent and experienced physician attended the patient with me, and hitherto we believed that the primary seat of disease was the lungs, and that the affection of the bowels was subordinate; but about this period the symptoms of disease in the mucous coat of the intestines became more striking. On the seventh he complained of a sense of constriction across the abdomen, but on the tenth he considered himself better. From this time, however, he gradually sunk, his respiration was quick and laborious, but he could make a deep inspiration without inconvenience, and pressure on the abdomen did not occasion pain. He died on the thirteenth, and during the last two days he voided a liquid bilious dejection about every six hours.

Dissection. The transverse arch of the colon was inflated to an enormous extent. The omentum and peritoneal coat of the intestines were inflamed, and the intestines were generally distended with gas, and with a large quantity of yellow feces. The mucous membrane of the stomach was slightly erythematous, and that of the duodenum, for an extent of several inches, evinced a high degree of erythema. The ileum, near its termination, was inflamed and ulcerated in patches, and nearly the whole inner membrane of the cæcum was destroyed. There was scarcely any apparent deviation from healthy structure in the lungs, though I thought them a little denser than usual.

Dr. Duchateau has published a fatal case of disorganization of the colon, the symptoms attendant upon which were regarded, even by Corvisart, as clearly indicative of aneurism of the heart: however, after death, all the thoracic viscera were found healthy.

The relation between the symptoms and morbid appearances has sometimes been the reverse of what occurred in these cases. There have been symptoms of abdominal inflammation, and then of thoracic effusion; yet after death the abdominal viscera were found healthy.

In the same month in which the preceding case occurred, I attended a girl in whom the ulcerative process must have been extremely latent, and its progress to a fatal issue was remarkably quick after symptoms of enteritis became manifest. She appeared to have contracted a modification of typhus by exposure to some relatives who laboured under that form of pyrexia; and on the twenty-seventh of September, when in an advanced stage of convalescence, pain in the bowels supervened, which was accompanied with obstruction and inflammatory symptoms. The

tions of substance which resembled flesh. The intestines certainly are often ulcerated in these cases, but not always. In a dysenteric woman, Brunnerus saw the orifices of the glands of the duodenum eroded; and in others who had laboured under protracted diarrhœa he discovered ulcers of a cancerous nature. In one patient who had been annoyed with a purging for a long time, he counted upwards of sixty small ulcers in the tract of the intestinal canal, and in another the colon betrayed signs of ulceration. When this lesion has taken place, those parts of the intestines which are the seat of ulceration being irritated by the contents of the ingesta, their expulsion is accelerated without sufficient delay for the absorption of chyle, or, indeed, for its complete formation.—13.

Many cases may be adduced which show that blood may be poured into the intestines from the orifices of the small vessels without any ulceration having taken place. Wagner observed this circumstance in a case of scirrhus enlargement of the mesenteric glands. The large and small intestines were devoid of that mucous secretion with which they

symptoms continued without abatement during the twenty-eighth, and on the following day she expired.

Dissection. The abdomen contained about two pints of a thick yellow fluid, exceedingly offensive; and flakes of lymph were suspended in it. The convolutions were united together, and the whole surface of the large and small intestines was highly inflamed, and covered with a coat of lymph. The villous coat of the intestines was inflamed and thickened; and that of the large intestines was ulcerated in several places, especially in the cæcum. In the ascending colon an aperture was formed by ulceration, capable of admitting a large quill, and through it feces had escaped into the abdominal cavity.

I presume that inflammation and ulceration commenced in the villous coat, and insidiously proceeded till the intestine was perforated, when the acute symptoms were developed by effusion into the abdomen. and the consequent peritoneal inflammation.—*Ed.*

are generally covered, and the rectum was in a gangrenous state. In consequence of the obstruction to the return of blood which arose from the indurated condition of the mesenteric glands, the small vessels exuded a kind of blue liquor. Glisson, in his Treatise on the Diseases of the Stomach and Intestines, relates, on the authority of Wharton, an instance of excessive vomiting of blood consequent on taking poison. After death, however, though the stomach contained a small quantity of blood, there appeared neither the rupture nor the ulceration of any vessel, but when the inner coat was wiped, with the handle of the scalpel, innumerable bloody points presented themselves on the surface.

When Boerhaave had been speaking of retention of the menses, and of the consequent effusion of blood by some other channel, he says, *Vidi hujusmodi hæmoptoen, quæ in consuetudinem abierat, ut sanguis floridus singulis mensibus, absque detrimento sanitatis, cum levi tussicula excrearetur. Vidi ubi evomebatur sanguis : vidi per alvum deponi, et per sudorem.* Haller has added a considerable number of examples in which it happened not only without detriment to health, but may be supposed to have occurred without ulceration. The circumstances which transpire upon the skin and on the surface of the stomach may take place in the intestines, so that, without doubt, in dysenteric affections there may be an effusion of blood independently of any destruction of parts by ulceration.—23.

It does not take place, however, without a concurrence of circumstances favourable to its production. If there is obstruction to the circulation through the vena portæ, there must also exist a dilatation of the discerning extremities of the vessels. Ortlobius placed a ligature on this vein in living dogs, but although the whole coat of the intestines was

imbued with a red colour, no blood issued from the intestines, because no dilatation of the orifices had taken place. The same author, however, speaks of a case of sphacelated intestines, in which the orifices of the mesenteric veins were enlarged and filled with coagulated blood. In dysentery there is sometimes genuine inflammation, and, from that state, a fatal degeneracy into gangrene takes place.—24.

CASE 16. .

Dysentery from inflammation; solitary kidney.

A woman died of dysentery.

Dissection. The intestines were found to be inflamed. The left kidney was altogether wanting, but the deficiency was supplied by the right, which was twice as large as that organ usually is, and was furnished with a double pelvis and double ureter.

Valsalva, xxxi. 25.

In a soldier who had been carried off by violent convulsions, whilst labouring under diarrhœa, Brunnerus found the whole intestinal canal, but especially the small intestines, considerably inflamed, and the stomach was not wholly free from marks of erythema. There were coagula of blood in the stomach, and a red mucus pervaded the intestines—circumstances which indicated that the diarrhœa was about to degenerate into dysentery. There was no appearance of gangrene, but it has already been shown that inflamed intestines readily pass into that state; and probably to this circumstance is attributable the fallacious disappearance of fever which not unfrequently happens a few days before death in cases of dysentery.

The membraniform substances which are discharged from the intestines during dysentery, with blood or mucus, or independent of either, appear

to consist of viscid mucus, which had coagulated upon the valvulæ conniventes. Sometimes it retains the form of the intestine, and even the resemblance of the valves, and has been mistaken for a portion of the intestines.—26.

As the glands of the bladder, when irritated, secrete a redundancy of mucus, which is not of the same quality as the healthy secretion, so likewise do the intestinal glands under correspondent circumstances. The result of this excitement in both cases is a white muciparous matter, and if there is a tendency in the blood to the formation of concretions, this secreted humour will be more liable to concreate. When the substance is very thick, it probably had been formed of coagulated blood.* We may thus understand how substances have been formed and voided which not only resembled masses of fat, but also shreds of concretions, as well as extended portions like membrane. If, when blood has been extravasated, the whole of the colouring particles have not been removed from the coagulable lymph, those substances will be voided which Celsus denominated fleshy.—17.

Ruysch has demonstrated that the delicate membrane which is occasionally exfoliated in the mouth is a continuation of the cuticle, and that it extends through the œsophagus, stomach, and intestines. The irritating quality of the secretions, or a superficial gangrene, may loosen this membrane from the inner coat of the intestinal canal, and though naturally the membrane is thin, it may undergo considerable thickening, as we sometimes observe in the cuticle upon the surface of the body from vesicatory applications.—20.

* The generation of membraniform concretions, by effusions of coagulable lymph, has been discussed. See vol. i. p. 262.

It has been supposed that the membrane lining the rectum has been ulcerated, and apparently detached from the intestine itself. I was consulted respecting a case of this nature on the first of June 1729. The patient was a jew-merchant; and at the decline of a malignant fever he had been affected with a most annoying pain in the rectum, accompanied with a sense of weight and obstruction. At length, in connexion with a discharge of blood, I perceived a thickish membraniform substance protruding from the anus. It was six digits long, and an inch wide; and its colour was cineritious, inclining to a livid hue, like the complexion of membranes affected with gangrene. Although there was an occasional discharge of blood, the substance I have mentioned did not fall off till the following day, apparently in consequence of adhesion to the intestine; and when it was separated it seemed to be torn away by the constriction of the sphincter. Blood and illaudable pus were subsequently discharged, and singultus came on; but, whilst other persons were greatly alarmed, the patient himself derived encouragement from recollecting that his father, when rather advanced in years, struggled through similar circumstances with the preservation of his life, though he was unable to retain feces ever afterwards.

On the sixth of July I found the man whose case I have been relating evidently gaining strength, and improving in complexion; and not only retaining feces, but also injections; and ultimately he perfectly recovered.—19.

I do not consider it certain, however, that real membranes are expelled in these cases. When the intestines are ulcerated, polypi-form concretions may readily be produced in that part either in a rounded form, or flat like membrane. At the same time I

believe that any part of the inner coat of the intestine may be separated by disease, without being attended with any very great effusion of blood, and therefore, whenever the excreted substance adheres to the intestines more than concretions generally do, the utmost attention and inquiry is requisite to determine its nature.—20.

The tenesmus which often occurs at the termination of a dysenteric affection I believe is frequently occasioned by the remains of irritating secretions and blood in the adjacent cells of the colon. They descend from this situation, and excite the lower part of the rectum—a part which is less patient of irritation.

The length of time which substances have been retained in the cells of the colon, even when neither small in quantity nor viscid, is truly astonishing. In the year 1744 I was informed that peas had lodged in the abdomen of a man for a period of five months. He had repeatedly eaten large quantities of them in the month of June, and in October following he was seized with dysentery, accompanied with singultus. The symptoms were uncontrollable, till, in the beginning of December, he voided two pounds of peas, which were so entire that several physicians preserved some of them as a curiosity. It was stated that a similar occurrence had happened to this man's father, only the retention was not so protracted. If there had been no misrepresentation, and certainly the case appeared to be well authenticated, I supposed they had been dispersed through the cells of the colon, which probably were more capacious in these men than they usually are in the human body.—27.

It must, however, be admitted, that ulceration or some other important lesion in the rectum does sometimes arise from dysentery. When I was a

young man, this result was evinced in the following case, respecting which my preceptors were divided in opinion.

A lady of distinction had been affected with dysentery, which ceased after fifteen days but she complained of constant pain at the lower part of the rectum, not only whenever feces were voided, but at other times; and occasionally it was conjoined with a troublesome pricking sensation. As she was a delicate woman, one of the gentlemen alluded to ascribed the inconvenience to slight abrasion. But observing that a perpetual sense of weight was conjoined with the pain, as well as fever; and that there was a sympathetic affection of the thighs, and of the lower part of the loins, with an immunity from tenesmus, the other individual, namely, Albertini, apprehended a more serious lesion. Her fever increased, accompanied with rigors, and from this circumstance he predicted the formation of an abscess. This prediction was soon verified by the discharge of two ounces of pus.—28.

Diseased intestinal glands.

The following case was communicated to me by Valsalva.

CASE 1.

Enlargement of the intestinal glands; apoplexy.

A man for some months had been seized daily with a gnawing pain in the stomach. It came on about five or six hours after eating, and a purging of yellow feces, with emaciation of the body, was conjoined with the pain. At length he underwent a slight apoplectic attack, but in a day or two the symptoms were mitigated, and he regained some

power of moving his hands, and the oppression of his intellectual faculties diminished. On the fifth day, however, the disease terminated fatally.

Dissection. Every part of the body presented a natural appearance except the brain and the intestine ileum. The ventricles of the former were occupied by a redundance of serous fluid; and in the latter there were seven or eight circular spaces, in which the glands were so developed as to equal the size of a vetch, and most of them were filled with a white secretion. These glands were not collected into a cluster, but were scattered and distinct.*

Morgagni, xxxv. 6.

CASE 2.

Ulceration of the glands in dysentery.

A man thirty years of age was attacked with dysentery. After this had continued for a long time, he was seized with hæmoptysis, and died.

Dissection. The small intestines were in a healthy state, but several parts of the colon were tinged with a black colour, and some of the glands were entirely eroded. The excretory ducts of the remaining glands were imbued with a bloody secretion. The gall-bladder contained but little bile.

* The mucous glands of the intestines, when diseased, present considerable diversity of appearance. Sometimes the glandulæ solitariæ are enlarged, at others, the glandulæ aggregatæ; and, not unfrequently, groups of the latter are discovered in a state of enlargement at the same time that the former are increased in magnitude. Occasionally this morbid development so closely resembles ulceration, that the distinction can scarcely be made without stripping off the inner coat. Nevertheless, ulceration does more frequently commence in these follicular glands than in any other tissue of the intestines. In the case related above it is probable that the affection of the head was the consequence of protracted derangement of the digestive functions.—*Ed.*

At the lower part of the cavity of the chest we found a considerable quantity of extravasated blood. The inferior portion of each lung was in a state of infarction, and, laterally, these viscera adhered to the costal pleura. This membrane, likewise, had sustained evident lesion.—*Valsalva*, xxxi. 14.

The state of the intestinal glands described in the preceding instance has been noticed after dysentery by other anatomists, and also that of the gall-bladder. It is true that, subsequent to dysenteric affections, this cyst has been discovered replete with bile, but sometimes it contains only a small quantity; and in a case of dysentery, which had terminated fatally, Platerus found it quite empty. Bontius met with an instance in which the cyst was distended with a white secretion resembling starch mucilage; and Lamonjerius met with it distended with pus.

That ulceration may take place early in dysenteric affections was shown in the case related by Platerus to which I have just referred. For though its duration had been short, there were innumerable small ulcers upon the inner surface of the ileum, throughout its tract, at the distance of three digits from each other. This case was somewhat analogous to one which occurred to Bassius, who, after dysentery, found the same intestine beset with ulcers. Generally they existed at about a finger's breadth apart, but some were at the distance of an inch. They proceeded nearly in a series, and seemed to occupy the situations of the glandular plexuses. From this circumstance I apprehend that the ulceration had commenced in them, and had ultimately destroyed the glands, for they were not discoverable.

It has already been stated, that in one body Brunnerus found upwards of sixty small ulcers which

were situated in these plexuses; and it may be inferred that in cases of intestinal fluxes the redundancy of fluid is secreted from these or some other glands, because they are generally enlarged, as happens in all other glands when their secretions are excessive. After protracted diarrhœa Brunnerus not only found ulcers at the termination of the jejunum, and tumefaction of the glands, but he also found the inner coat of the intestine thickened, and of this coat he says—*A principio usque ad exitum tota quanta glandulosa, glandulisque luxurians videretur.* Concerning the duodenal glands he adds—*Solent crassiores esse in iis qui ex morbo intestinorum, diarrhœa aut dysenteria moriuntur.* In the case in which he saw the orifices eroded, the glands themselves had become indurated.—15.

CASE 3.

Enlarged glands, and remarkable emaciation.

Near the end of January 1753, the body of an elderly female who died in consequence of a protracted diarrhœa, was brought into the anatomical theatre. She had been reduced to the utmost degree of emaciation.

Dissection. There was no appearance of adipose membrane beneath the skin, but merely a thin reticulated membrane, retaining scarcely a vestige of fat, which is a very rare occurrence, even in the leanest bodies. The cæcum was reddened by inflammation. The rectum was universally of a livid hue from the same cause, and in some places the inner coat was tumid, especially at the lower part, where a prominent circular spot, an inch broad, and of a soft texture, presented itself. It appeared to have been formed by blood, effused under the internal coat, and half coagulated. Above this part the lenticular glands were prominent.—*Morgagni*, lxxv. 5.

Excrescences in the intestines.

It has been shown that substances of a membraniform nature are often thrown off from the intestines in dysentery, and this may take place independently of ulceration; but real fleshy substances are sometimes expelled, the separation of which must have been effected by that process. In the colon of a nobleman, Io. Baptista Cortesius found a large mass of flesh which, by its bulk, had impeded the descent of feces, and ultimately occasioned the patient's death. The following example cited from Fantonus particularly relates to the present subject. In the body of a man who died from a violent dysenteric affection, he found the colon ulcerated at no great distance from the cæcum, and bloody pus was secreted by the ulcer. At the same part he found a thick and round body, of a fleshy texture, and about eight digits in length. It arose from the ulcerated coat by a small peduncle, which lay pendulous in the canal, and nearly filled it. It exceeded the weight of a medical pound. This was not a concretion in the form of a polypus, but a true fleshy polypus like those of the nose.—*Morgagni*, xxxi. 21.

An excrescence may be constituted, however, of organized substance in the interior, whilst its bulk is enlarged by the adhesion of viscid matter, or of coagulated blood, to the surface.

In the year 1736 I was consulted by a physician respecting a nobleman who had experienced frequent dejections of blood, succeeded by bilious diarrhœa, and accompanied with continued fever and considerable pain in the abdomen. At length, after some pints of blood had been voided, he expelled, with the assistance of his surgeon's hand, a substance which was nearly a span and half in length, and varied in the degrees of thickness. From the time at

which this body was ejected, there was no discharge of blood, but an extremely fetid purulent matter preceded or followed the feces, and the patient continued to suffer acute pain; but all the symptoms of disease gradually disappeared. My opinion was, that the origin and roots of this body were fleshy productions, which had been attached to the intestine near the termination of the colon, and that the hæmorrhage had taken place in consequence of that ulceration by which they were ultimately disunited. However, out of all the cases which I have read, I recollect but one in which the substance was evidently furnished with blood-vessels, and that is related by Peyerus. When vascularity is distinctly observed, no doubt can be entertained that the production must be regarded as an excrescence; but it is easy for us to be deceived by polypi-form concretions; and distinctions can scarcely be relied upon, unless made by a cautious and experienced practitioner.—22.

Scirrhus and contraction of the intestines.

Within the coats of the intestines a scirrhus ring sometimes forms, which appears to consist of diseased glandular texture. Haasius met with an instance in which there remained a foramen scarcely sufficient to admit a small probe. Christian Wencker described an example of transmutation of a portion of the intestine a little above the rectum, into a callous and almost cartilaginous substance, by which the caliber of the bowel was greatly diminished. Laubius observed the coats of the colon so contracted, through a considerable part of its tract, that feces could not descend; and a similar affection was seen by Waltherus extending through the greater part of the rectum. The canal of this intestine has undergone diminution in consequence of glandular tumours com-

pressing the upper part of it ; and Tulpius, on whose authority the preceding circumstance is recorded, found it not only remarkably straitened by the pressure of two calculi in the urinary bladder, but its cavity was closely interwoven by membranous filaments, by which the transmission of excrement was completely obstructed. He had also observed similar filaments obstructing the œsophagus when it had been compressed by a carcinatous tumour.

Lancisi met with an instance of insuperable constipation, which originated from a dilated state of the lower part of the colon. The dilatation and weight of this part urged the uterus towards the rectum, and in this manner straitened the gut.

Hasenest met with a case in which the descent of feces was impeded by numerous adipose appendages, which were situated exterior to the rectum, and in form they resembled a small pear. Had their texture not been soft they must have completely obstructed the passage of excrement.

Morgagni, xxxii. 5.

The coats of the rectum are also liable to even scirrhus thickening, by which they sometimes extend to the thickness of an inch, and become so indurated that Ruysch hesitated whether he should consider them fleshy or cartilaginous. Occasionally, too, the circumference of the cavity is so exceedingly lessened, that a slender probe can scarcely be passed through the aperture. In such cases evacuations are not obtained without violent straining, and are voided in drops ; or if more solid matter is extruded, it is in pieces scarcely thicker than a stalk of grass. Ruysch had only seen two cases of this disease, and considered it one of infrequent occurrence.

Valsalva informed me that he had met with such cases, but I have not found them recorded amongst his papers. I have found memoranda, however,

of two cases in which he ascribed the difficulty in the extrusion of feces to the enlargement of glands in the rectum, and their partial ulceration: and in one of them, he says, an annular projection could be perceived within the intestine, at about three inches above the anus.

I was consulted respecting a lady of rank, who for many months had voided feces which were flattened like a garter; and on introducing my finger, the circumference of the intestine, a little above the sphincter ani, to an extent of two digits, was observed to be protuberant, and the canal was, by this means, so much contracted, that the point of the finger could not be introduced without using force and exciting uneasiness. Before the expulsion of feces there was a slight purulent discharge. Previous to the commencement of disease in the rectum, this patient had been affected with tumefaction of the inguinal and axillary glands, and likewise with pustules and ulcerations; and therefore I regarded this as an instance similar to those which came under the notice of Valsalva. I was led to this conclusion by other cases, and one of them I shall subjoin.—6.

CASE 1.

A woman about fifty years of age was brought into the hospital of incurables at Bologna, about the end of 1704. She reported, that having been subject to hæmorrhoids, the disease began to assume a more serious form three years before her coming into the hospital. When Valsalva had interrogated the woman, he considered it a case of glandular protuberance in the circumference of the rectum. She experienced no pain, but had a copious discharge of fetid matter, which was sometimes thin, but at others it was of a thick consistence. After experiencing

febrile affections, with chilliness, and being reduced to an extreme degree of emaciation, she died one or two months after coming into the hospital.

Dissection. At the distance of six or seven digits from the anus the coats of the rectum began to be hard and thick, and there were protuberances within the intestine which resembled large beans. The surface of these bodies was smooth, but their texture was solid and compact—they were like conglobate glands in colour and form. The induration and thickness of the intestine, and the magnitude of the protuberances, proportionably increased towards the rectum, but so much of the rectum at its lowest part as could be covered by the breadth of a finger, was perfectly healthy. Two excrescences hung from the extremity of the anus, and the cutis around this orifice was slightly ulcerated.—7.

This disease is often unperceived till it arrives at an advanced stage, when, in consequence of inconvenience attributed to piles, the finger is introduced, and the real state of circumstances ascertained. The lesion is frequently seated too high to admit of removal with the scalpel.

In operations about the anus there has existed great apprehension of dividing the sphincter ani, and by this means, of destroying its functions. The experience of other surgeons, indeed, had tended to lessen the fear of this consequence; and Valsalva divided the sphincter in dogs, for the sake of experiment, and the muscle regained its power, and performed its office, though not so strongly as before. He observed a similar occurrence in the human subject. In 1708 an abscess and succeeding gangrene had destroyed part of one buttock, and the whole corresponding portion of the sphincter ani, so that feces were discharged involuntarily; yet when the ulcer healed, the sphincter regained its office. The

higher we ascend above the sphincter, the more dangerous will an incision be, either from the greater hazard of dividing a larger blood-vessel, the hæmorrhage from which we may be unable to suppress; or we might wound a nerve, or penetrate the abdomen.—8.

When the disease does not admit of effectual relief, we must be careful to preserve the feces of a soft consistence, and to employ such other palliative measures as the case may demand.*—9.

* Although other parts of the intestines are liable to scirrhus, it most frequently attacks the sigmoid flexure of the colon and the rectum, which seems chiefly attributable to their being more glandular. Instead of its natural texture it presents a gristly hardness, feels knotty sometimes when examined with the finger, adheres to and involves the adjacent parts, and, by ulceration, may communicate with the bladder or vagina. The cavity of the intestine, of course, is contracted, and often becomes obliterated. Some time ago I had an opportunity of examining the body of a young lady who died from a scirrhus-contracted rectum. She had been afflicted with the disease for some years, and at length the gut became completely obstructed. In this exigency one of our most eminent surgeons was consulted, who, after considerable exertion, thrust a catheter into something like an abscess, from which pus and excrement were discharged. Either from deficiency of moral principle, or from inattention to the history of the case, he assured both the patient and her friends that he had removed the disease, and she would recover. Certainly she was able to expel liquid feces; but she was worn down by protracted and continued suffering, and died in about ten days after the promised restoration. The upper part of the rectum was in a state of scirrhus-contraction, but there was an aperture sufficient to admit the end of my little finger. Ulceration had taken place, and a large cavity had gradually formed in the hollow of the sacrum, behind the rectum. When this became distended with pus and excrement it acted mechanically on the gut, and completely intercepted the canal. Into this abscess the surgeon had forced his instrument, and thus afforded temporary relief.

Mr. Blacket has related a case of stricture in the rectum, which occurred to an indolent man, who had been a free liver. The bowels were at first torpid, and at length for several weeks he voided nothing. After death the cæcum, and the transverse

Hæmorrhoids.

There are two affections produced by constipation of which it remains for me to speak, namely, a dilatation of the hæmorrhoidal vessels, and prolapsus ani. Although the latter is not an unfrequent occurrence, instances of the former are more common.

The most inward vessels of the rectum unite in the vena portæ; and if any obstruction to the current of blood arises either in their course or at their termination, it is natural to suppose that the blood will be too long delayed in the hæmorrhoidal veins. This effect may be produced by obstruction in the liver, by distention of the intestines, or by any other cause adapted to straiten the vessels. In a case of extreme induration of the liver, Vesalius observed the internal hæmorrhoidal vein, at the extremity of the colon, and through the rectum, as large as a man's thumb. This vein is more liable to dilatation than many others from such a cause, on account of its length, and the ascent which the blood circulating through it must effect; and it is on the same account that the veins of the leg are so frequently varicose.

On dissecting the body of a somewhat plethoric but healthy man, who died from a wound in 1706, the extremity of the rectum was unequal from various knots of veins; and I was surprised to observe, that although they contained a large quantity of grumous blood, only the smallest vessels

arch of the colon were found to have burst. Nearly a common pailful of feces was removed.—*Med. Rep. Jan. 1820.*

The canal is sometimes contracted, yea even obliterated, by a band of lymph possessing the appearance of tendinous structure. It generally originates from some inflammatory affection, and the inconvenience resulting from it will be modified by the degree of constriction.—*Ed.*

communicated with them. It was evident that some very small vessel had undergone this expansion.—10.

These affections do not occur without pain, especially in the act of expelling feces when the varices are turgid; and, on rupturing, the hæmorrhage is sometimes copious. It is therefore highly expedient to avoid plethora, as well as every thing that tends to constipate the bowels. Here I do not merely allude to things which have an astringent property, but to a system of eating, and especially of drinking, more sparingly than the powers of life can sustain. If an emollient diet does not prevent the feces remaining till they acquire a firm consistence, I know of nothing preferable to the injection of an ounce or two of oil, especially of linseed oil, a little before having a dejection.—11.

Prolapsus of the rectum.

No anatomical observations on this disease, so far as I know, are extant, and it is upon investigations of that nature that sound reasoning concerning the origin or continuance of internal diseases is generally founded. The following observations, I acknowledge, are not very satisfactory to myself. They were written on account of a consultation respecting this affection in a nobleman of considerable literary attainments. I am unacquainted with the circumstances in which it originated in this personage, except that it came on after violent fever, and was increased by powerful and protracted straining in the expulsion of feces; but I am as ignorant respecting the particular manner in which these efforts increased it, as I am uninformed respecting its commencement, in consequence of the circumstance having occurred at a remote distance.

Morgagni, xxxiii. 1, 2:

The causes of this disease may not only be numerous, but attended with some discrepancy. My fellow citizen Hieronymus Mercurialis, and Ambrose Parey, ascribed it to a relaxation of the sphincter ani; but as the intestine does not immediately descend in cases of paralysis of this muscle, I cannot acquiesce in their opinion. Riolanus suggested the relaxation of the levatores ani, in addition to that of the sphincter, and most other physicians admit this doctrine; but the portion of intestine which could remain exterior to the anus from this cause alone, is only the extent of a few digits of the lower part, and therefore, though it might have originated in these circumstances, the relaxation of those muscles will not explain cases in which there is a prolapsus of eight, ten, sixteen, or twenty digits.—3.

It becomes requisite, therefore, to look for some other cause; and this may be found in a separation of the intestine from the mesocolon, or some other circumstance which is equivalent to this. From the firmness of its ligaments, and the strong connexions of the rectum with the adjacent parts, as the vagina in females, and the neck of the bladder in men, it has been supposed to be impossible for that bowel to be entirely protruded; and therefore a suggestion has been offered, that it might be a descent of the thickened inner membrane only. When I consider, however, such cases as that related by Fabricius ab Aquapendente, in which the prolapsus of the intestine was as long as the fore arm, and as thick as both arms conjoined, I am inclined to believe that the lower part of the rectum sometimes remains unmoved, whilst the other parts descend through it and become inverted. In my work entitled *Adversaria*, I have shown that in some persons the mesocolon is larger than in others: and possibly, the

length of the prolapsed substance may, occasionally, be increased by an elongation of the inner coat.—4.

When the disease has become inveterate, or has afflicted the patient for several years, I never heard of its being removed. In such instances we must consider what palliative expedients can be adopted, not only to relieve the uneasiness, but also to prevent the increase of the disease.—6.

Various instruments have been invented for the purpose of keeping the intestine within the body, the principal of which was contrived by Paul Sarpi, and consists of an iron ring enveloped with soft leather, and confined to the anus by means of girdles. The ring was not sufficiently large to allow the intestine to pass through during the expulsion of feces.—7.

In the instance, however, for which my advice was particularly solicited, the patient could not evacuate the bowels unless he allowed the intestine to protrude; which probably arose from the relaxation being so considerable as to form valve-like rugæ, when urged downwards by the accumulated excrement.—8.

It has been recommended to apply the actual cautery to the anus, with a view to produce a firm cicatrix, by which the aperture may be contracted. This practice may be useful in a case of slight relaxation, and when it has been seated low; but should it be considerable in extent, or if it has commenced high within the intestine, I am apprehensive it would render but little service, if any.—10.

Blegny has more recently recommended an expedient to retain the prolapsed bowel in its situation, which he asserts to have been useful in numerous cases. It consists of the claw of a cock, which was introduced within the rectum, and inflated by means of a slender canula of silver. This

contrivance certainly would not answer the purpose of retaining the intestine in its situation, at that period when retention is the most desirable, namely, during the expulsion of feces. Nevertheless, I think the apparatus cannot be without some advantage, especially at the commencement of relaxations of this nature. However, it might be a proper subject of consideration, whether, instead of the craw, it would not be preferable to use a portion of intestine, having thin coats, and of a suitable length and diameter. Its upper extremity should be closed, and the gut being smeared over with a medicated application, must be introduced after a dejection, and then distended with air or a liquid. The distention should not be carried to such a degree as to excite a desire of evacuation. Perhaps it is not easy to discover a more commodious or innocent auxiliary to replace and retain the relaxed coat of the intestine, or the intestine itself. However, though I suppose that this method may be useful in the commencement of the disease, and certainly is preferable to tents, nevertheless, I must confess myself ignorant of the advantage to be anticipated from it in an inveterate case.*—11.

Corroborating medicines will be useful, but they should not possess strongly astringent properties, lest the feces become indurated, and require violent straining for their expulsion. Purgatives must be avoided, and if aperients are requisite, they should

* Prolapsus of the rectum may be produced by costiveness, worms, aloetic purgatives, or any cause of continued irritation; and it appears to be kept up by topical relaxation, when the exciting cause may be removed. The expedients to support the gut, alluded to by Morgagni, are ingenious; but a pessary of elastic gum will answer the purpose in a much more simple and equally efficient manner. In slight cases a compress and the T bandage will suffice.—*Ed.*

be of the mildest description, particularly enemata.—12.

The diet should be simple and light, and such articles of food should be selected as tend to keep the bowels gently open. From an abstemious plan of diet less excrement will be formed, and the intestine will be replaced more easily than when a large quantity has accumulated in the colon. Beside this advantage a smaller quantity of blood will be engendered, and consequently, the weakened parts will not be so liable to be thickened. All violent exertion must be avoided, and indeed everything which protracted experience may have demonstrated to be injurious.—13.

The disease sometimes proves fatal in consequence of inflammation and gangrene affecting the intestine when its reduction has been too long neglected. Many persons die from other causes, whilst labouring under this disease, and therefore opportunities of examination after death frequently occur.—15.

Intus-susceptio.

When a portion of the intestine enters another contiguous to it, the consequences are more serious from its being accompanied by the annexed mesentery. For should it remain there a considerable time, and constriction ensue, the circulation through its vessels will be retarded—it will become swollen to such a degree that the included intestine cannot recede—and the progress of the intestinal contents will be interrupted. Sphacelus is also liable to come on from the obstructed circulation. Haller found that this circumstance had been the cause of a man's death, whose body he dissected. Ruysch frequently

met with intus-susceptio of the small intestines, but he only once discovered it in the colon.

There is no cause more common than convulsive actions in these viscera. That this cause was capable of producing intus-susceptio is clearly shown by an experiment which was instituted by Peyerus, in which he stimulated the intestines of a living frog in different places. It is also confirmed by the observations of the same individual, and more particularly by those of Ruysch. In the intestinum ileum of a girl, in which there existed three intus-susceptions, Peyerus discovered a heap of lumbrici; and, in the body of a man, Ruysch found the contained portion of ileum actually filled with worms. On another occasion, in a boy, he showed a similar morbid appearance, which also contained worms. It is very evident that the intestines are extremely irritated by worms—indeed ileus may sometimes be produced by them: and, probably, the frequent occurrence of intus-susceptio in children is ascribable to their peculiar liability to be infested by these animals.—*Morgagni*, xxxiv. 32.

CASE 1.

A maiden forty-five years of age, having received a violent blow upon her head from a fall, not only vomited at the time, but she continued to vomit afterwards. She came into the hospital, and survived the accident twenty-one days. Her death occurred about the middle of December 1724.

Dissection. I examined the abdominal viscera only, which were still warm, though many hours had elapsed, and the season was excessively cold. Some parts of the small intestines were inflated with gas, especially that beneath the cæcum, which, with its appendicula, was turned forwards. The remainder

was somewhat red, exhaled a rather putrescent odour, and was the seat of an intus-susception. Whilst endeavouring to ascertain more distinctly in what part of the intestine it existed, the intus-susception had disappeared, from which it was evident that no close constriction had occurred. Opening the small intestines, I found that the duodenum contained matter resembling liquid feces; and, in the neighbouring jejunum, I discovered a lumbricus teres. Within the same tract, as well as in the duodenum, there were bloody spots, which appeared to be the commencement of inflammatory action in consequence of irritation.—*Morgagni*, xxxiv. 33.

In this maiden there was, on the one hand, gas to distend the intestines, and, on the other, a worm, the irritation of which might contract the gut, and excite inflammation. But although, with these circumstances, the contents of the duodenum resembled fluid feces, yet the loose state of the susception, and the slight degree of inflammation combined with it, induce me to ascribe the obstinate vomiting rather to the injury of the head than to the displacement of the bowel.

Intus-susceptions have occurred, however, which were not so easy of evolution, and yet they had been unattended with ileus—indeed, the functions of the bowels continued to be naturally performed. Widmann found upwards of a geometrical foot of the intestinum jejunum included within the successive portion. It was considerably straitened and compressed, and of a livid hue, but was pervious. The patient had undergone almost continual, but not stercoraceous vomiting. There had been no suspension of dejections. In the case of a woman who died after having undergone violent pain in the abdomen, accompanied with obstruction of the bowels, and ultimately with volvulus, Weissius found the extremity of the

ileum had been received into the colon, and their coats were inflamed, and adherent together. This part was so contracted as to intercept the progress of the fetid excrement.*

To these observations others might be added, which indicate that an obstruction of the intestinal canal, or considerable and protracted contraction, has more effect than inflammation, in producing volvulus; and, therefore, an intus-susception that does not obstruct the bowels, or materially narrow their canal, is not likely to excite this inverted action.—34.

Volvulus, however, may be occasioned not only by intus-susceptio, but also by hernia, by inflammation of the intestines, and by any other cause which either obstructs or stimulates them. The obstructing cause may be seated in the coats of the intestines, or it may originate from their contents. A scirrhus ring formed in the intestines may afford an example of the former: and accumulation of feces, incrustated biliary calculi, and coins which had been swallowed, have operated as causes of the latter description. In

* Intus-susceptions happen indiscriminately from above downwards, or from below upwards; and sometimes four or five are met with in the same individual without any particular organic lesion. The frequency of their occurrence in children induces a suspicion that the drastic purgatives by which their bowels are often irritated, not unfrequently contribute to their production. When no adhesion is contracted, nor any stricture formed, the peristaltic action will probably soon adjust the displaced bowel. But when inflammation arises, or a permanent stricture forms, it becomes a most perilous disease. Dr. Monro relates a case, in which fifteen inches of the ileum were discharged by stool, and the man enjoyed good health for seven years afterwards. The doctor's father was accustomed to explain this remarkable occurrence, by supposing a previous intus-susception, and imagining that a stricture had strangulated the portion of intestine evacuated, and had occasioned mortification at the upper part. At the same time, by exciting adhesive inflammation in the superior and inferior portion, they became united together, and a continuity of canal was preserved.—*Ed.*

the person of a prince, who had been affected with ileus, Hoffmann discovered an accumulation of scybalæ, to the quantity of twenty pounds, by which, ultimately, the colon was ruptured.

Among stimulating causes of inverted peristaltic action we may place the instance of a young man whose bladder was ruptured by a fall, the particulars of which are inserted in the publications of the Cæsarean Academy. The urine effused into the abdominal cavity produced inflammation and gangrene, and ileus was the consequence. Whatever stimulus engenders spasmodic contractions, may not only produce intus-susceptio, but likewise ileus.—35.

Worms must of course be enumerated amongst the causes of ileus. It has already been intimated that they may occasion intus-susception and volvulus, but they may produce the latter independently of the former. Sometimes they only excite pain in the intestines; and instances are not wanting in which a great number of worms were discovered in the bowels after death, although, during life, there had been no symptoms of their existence. Cases have occurred in which the coats of the intestines have been perforated by worms, and though this might sometimes have happened after death, yet, at others, it had unquestionably taken place in the living body.*—36.

Morbid secretions.

CASE 1.

Diarrhæa from dentition.

An infant seventeen months old was affected with

* Not only have lumbrici perforated the intestines of the living body, but they have likewise escaped through the parietes of the abdomen, and yet the patient has perfectly recovered.—Ed.

diarrhœa. To this, febrile symptoms and cough were added, with itching of the gums and nostrils, indicated by the child frequently rubbing them with its fingers. The diarrhœa increased. The dejections, which had previously been yellow or green, now began to acquire a bloody tint, and, about the seventh day, they became black, and, at the same time, singultus made its appearance. On the ninth day the purging ceased, and scarcely had seven or eight hours elapsed when oppression at the præcordia, with constant anxiety and disquietude came on, and the child died the same day.

Dissection. The intestines were turgid with gas, and contained a small quantity of exceedingly black matter, like that which had been voided. There was a moderate redundance of serous fluid in the pericardium, and also in the brain.—*Valsalva*, xxxi. 5.

There were no worms, though, from the symptoms, we might have expected to find some in the bowels. The itching of the gums showed that teeth were about to be cut. It has already been shown how easily dentition may excite convulsions, but when a moderate diarrhœa is induced, it tends to prevent the convulsive affection. Although the very black colour of the intestinal discharges succeeded the bloody tinge, it must not be supposed that they were really nothing else than blood—*Valsalva* would readily have distinguished it had this been the case. Blood might have been effused by the small vessels in the first instance, but the deeper colour arose from morbid secretions.—*Morgagni*, 6.

Black stools of this nature often are pernicious not so much on account of their quantity as by their effects. But other intestinal discharges, that are equally free from blood, as those which are yellow, green, watery, and others of this nature, are sometimes not destructive merely by the pain they occa-

sion, but also by their quantity. These evacuations generally originate from some stimulus which irritates the intestines—a circumstance which is elucidated by the effects of violently purgative drugs.

Besides the pancreas, the liver, and the gall-bladder, there is a very extensive surface of intestine from which unhealthy secretions may take place. We are not to imagine that whatever is discharged of a yellow or green colour is entirely bile, for a small quantity of this secretion will impart its colour to an abundance of fluid. The tormina which the patient may experience does not always arise from the quantity of bile which is mixed with the feces, for griping pains have occurred when there was a deficiency of hepatic secretion. Willis has described cases of diarrhœa in which an almost watery and limpid fluid was evacuated, and so much griping pain was experienced that he denominated them dysentery. The same author describes an affection which seized many of the inhabitants of London in the autumn of 1670, when, from a state of perfect health, the power of body was so extremely reduced within twelve hours that the sufferers appeared to be on the point of death. This sudden exhaustion did not ensue from the excess of discharge, for the loss of an equal quantity of pure blood would not have produced equal debility.

Marcellus Donatus, on the contrary, has narrated particulars relative to a woman in whom syncope was occasioned by the excessive serous excretion. So copious was the evacuation, that a large vessel was filled at one dejection. Porterius mentions a notary, who, within one day, voided upwards of forty pints of serous matter, and it nearly proved fatal to him. There might, however, have been some irritating quality conjoined with the redundance.—8.

In the year 1733, after travelling from Forli to

Pesaro and back, I was seized with such a profuse diarrhœa, that within twelve hours I discharged at least sixteen pints of a serous fluid which was almost limpid. The pain was but slight, and the dejections were not very frequent, but copious. Experiencing some nausea, I was induced to excite vomiting by drinking broth, and having thrown up a small substance, of a greenish colour, which appeared to be a small leaf of a boiled herb, the sickness and diarrhœa were cured simultaneously. This attack, however, had so reduced me in flesh and strength, that I did not perfectly recover for some days.—9.

I believe that the primary cause of irritation was seated in the stomach; and it is unquestionable that irritation and action excited by an irritant in the stomach, from which serous excretions ensue, may be propagated to the intestines. Riolanus has related the case of a woman who was affected with an excessive discharge of a white fluid from the intestines, by which life became extinct in fourteen hours. On examination after death, ulceration was discovered at the fundus of the stomach.—10.

The following case was communicated to Albertini by Bernardoni.

CASE 2.

Diarrhœa without an obvious cause.

A priest labouring under diarrhœa voided feces which presented a variety of appearance, without being either bloody or purulent. He experienced very severe pain in the bowels, and died on the thirteenth day.

Dissection. The inner surface of the whole intestinal canal having been examined, neither abrasion nor ulceration was discovered; and it was even more remarkable, that the villous coat was not even

destitute of that mucus with which it is naturally besmeared.—*Morgagni*, xxxi. 12.

Constipation.

The opposite condition of the bowels, namely, constipation, I have observed in many individuals without its being manifestly detrimental to health, although some of these persons did not expel any feces for weeks in succession, or even for a month. Generally, however, it has been conjoined with evident lesion, from which fatal consequences ensued.

Morgagni, xxxii. 1.

Instances of obstruction from calculi adhering to the colon or other parts of the intestinal canal, are recorded in the *Sepulchretum* and in other works.*—2.

Malformation of the anus.

In consequence of malformation, the rectum has sometimes terminated in the bladder or vagina, and the feces have been transmitted through those parts. Benivenius has related the particulars of a girl who lived to the age of sixteen, but had always passed her excrement through the vagina. She died under excruciating pain in the intestines, probably in consequence of induration of the alvine substance, for, usually, she had no dejection oftener than once in eight days. Other

* Independent of organic affections the intestinal canal may be obstructed mechanically by scybalæ, pellets of worms, concretions, fragments of bone, and other foreign bodies. Costiveness may be occasioned, also, by deficiency of bile, and of the pancreatic juice; and it has been imputed, also, to a defect of the succus intestinalis. It has been, likewise, ascribed to a morbid celerity of absorption, to the habitual use of dry and viscid aliments, and a too sparing employment of liquids: and it arises sometimes from debility, spasm, paralysis, and sedentary habits.—*Ed.*

individuals, under a similar misfortune, have lived to an advanced period, and one female attained the extraordinary age of a century.—*Morgagni*, xxxii. 3.

When the anus is imperforate, and nature has opened another channel, through which an adequate discharge of excrement takes place, the inconveniences are to be preferred to an operation which is attended with danger, and ought only to be performed in a case of urgent necessity. Unless the anus should be closed merely by a membraneous production, so that on making a slight incision an exit may be afforded to the meconium, the operation will only tend to expedite the infant's death. If the whole rectum should be solid, or totally wanting, (for of both these circumstances examples have occurred,) the division must be completely unsuccessful.

The imperforation sometimes presents a form which may easily deceive the surgeon, for the lower part of the rectum is sufficiently pervious, but on introducing the finger a short distance, and perceiving an obstruction, he is led to believe that it consists merely of an interposing membrane, and indulges the hope of successful division. Nevertheless, it may be found that the intestine had terminated at the upper part of the os sacrum.

Several infants in the same family have been the subjects of this malformation. In a case in which death took place the day after an incision had been made, two brothers of the little patient had previously been born with an imperforate rectum.

Although the surgeon may not always be blameworthy if the infant dies as early as happened in the case alluded to, yet, unless it should appear from dissection that the operation had not been the cause of death, he will not escape the reproach of having hastened that event, unless he shall have duly considered every circumstance of the case. Whenever

another aperture, though inconvenient, is sufficiently open, and it is not certain that the rectum is merely closed with skin, or by a membrane of no great thickness, we ought not to divide the parts for the purpose of searching after that which may terminate higher up, for example, in the upper part of the vagina, or in the bladder. Unless the incision penetrates the bowel it can have no good effect, and if it should reach so far, probably the preternatural aperture may never become obliterated, and the artificial opening may double the annoyance, in consequence of wanting a sphincter.—3.

When the rectum terminates in the male bladder, the probability of life is somewhat less than when it opens into the same viscus in the female. This difference arises from the narrowness, the length, and the flexure of the male urethra. Should there exist no outlet for the meconium, certainly a doubtful expedient should be preferred to the inevitable death of the infant; and the operation should not be delayed till the long retention of excrement begins to affect the health, when the little patient will be in a state less favourable for the operation. The uncertainty of the result should be announced; and as there is some risk of wounding the bladder in the male, and the vagina in the female, whenever the instrument must necessarily be conducted high up, a person ignorant of anatomy should not undertake the division.

Besides a very thick membrane, sometimes spongy flesh and adipose substance, to the depth of two digits, are interposed. In another case related in the *Sepulchretum*, close adhesion existed, to the extent of an inch and a half, yet the child lost but little blood during the perforation, which it survived, and lived to a very advanced age. Hoyerus

cured another infant after being compelled to make an incision more than an inch deep.*—4.

Hernia.†

CASE 1.

Strangulated inguinal hernia.

A man forty years of age, of a sanguineo-bilious temperament, who had occasionally been afflicted with a small inguinal hernia, was seized with ileus after eating artichokes. A slight degree of tumefaction appeared in the groin, but he denied having any pain in the inguinal regions. He experienced violent pain, however, in the abdomen, which was extremely tense from the retention of feces. The means employed proving ineffectual, he sunk under the vomiting on the seventh day of the disease.

* Morgagni appears to have described cases in which the rectum was imperforate in consequence of the common integuments, or of a membrane, more or less thick, being extended across the anus—or from a membranous septum within the rectum. He has also adverted to the fact of obliteration in consequence of adhesion and consolidation through a considerable extent of the rectum, and to the termination of the colon in a cul-de-sac. And he has given examples of the rectum opening into the bladder or vagina. The expulsion of meconium by the anus is sometimes prevented by extremely rigid contraction, so that a probe can scarcely be introduced. A child was brought to me some years ago with this imperfection, and the feces passed through the vagina. On another occasion, when attending a female nearly forty years of age, in parturition, I perceived that, with the descent of the foetal head excrementitious matter escaped per vaginam. I found a congenital communication between that canal and the rectum, capable of admitting two fingers.—*Ed.*

† It is scarcely requisite to observe, that the following cases are only adapted to display a few pathological facts in relation to hernia. In some respects they do this better than cases of modern occurrence, because they appear to have been either abandoned to their course or treated inefficiently.—*Ed.*

Dissection. When the abdomen was opened, the intestines appeared to be turgid with gas, and near the cæcum they were doubled, and had descended, with the annexed portion of mesentery, into a hernial sac, four digits in length. The orifice of the sac was so narrow, that the intestine had been incarcerated, and presented a livid and black complexion, and the mesentery exhibited a fleshy appearance. The sac was formed by an extension of the peritoneum, and was situated anterior to that process of this membrane which accompanies the vas deferens and spermatic vessels. These vessels were very turgid with blood. The inner surface of the sac, as well as the intercepted portion of intestine, was of a greenish black colour. There was a hernial sac in the left groin, which was similar to the former, excepting that it did not deviate in appearance from the natural structure of its constituent parts.

Morgagni, xxxiv. 5.

When the appendix cæci, or an elongated portion of the large or small intestines similar to that appendage, is included in a hernia, the patient may have stools, contrary to what happens when the tube is wholly intercepted. It is unquestionable that appendages are occasionally formed besides that which is natural. They are called diverticula, and sometimes extend into a hernial sac. It does not appear that all of them are of gradual formation, and particularly that they originated in consequence of the side of the intestine protruding into a hernial sac; for sometimes they are appended to those intestines which are not situated where herniæ occur. Usually, indeed, they are connected with the ileum, but they have been observed proceeding from the other intestines.—16.

Once I discovered a process of this nature in the rectum, and, on another occasion, in the duodenum.

In the latter it was situated about two digits below the pylorus, and was a kind of cellule not very projecting, and its orifice was large enough to admit a finger. It was only surrounded by the external coat of the intestine, but there was no appearance of ulceration, nor was there any trace of its having existed at any former period.

Occasionally they may originate in some morbid cause, but frequently they are congenital.

When they are contained in herniæ, and become strangulated, the symptoms will usually be very different from those attendant upon other ruptures. They will advance more slowly, the symptoms will be less violent, the detrusion of feces will not be impeded, nor will the abdomen be tumid or tense. That these distinctions, however, cannot always be relied upon, will be demonstrated by the following instance.—17.

CASE 2.

Inguinal hernia ; a diverticulum incarcerated.

A porter who resided at Bologna, fifty years of age, and broken down with constant labour, had a hernial tumour in the right groin, the size of a man's thumb. Sometimes it apparently vanished, but about the middle of March 1706, without any obvious cause, he was seized with pain in the abdomen. The pain, though wandering, was so severe that he compared it with canine gnawing. On the sixth day he was brought into the hospital of St. Mary de Morte. His skin was nearly cold ; his pulse exceedingly frequent and small ; and not only did it offer but slight resistance to the fingers, but it struck them with unequal force. The whole abdomen was distended like a drum, especially below the right hypochondrium, where the cells of the colon could

be distinguished by the hand. The hernia was exceedingly tense, but not the principal seat of his pain. He vomited his food, and voided no feces, nor could he even expel flatus. He died in the evening of the ninth day.

Dissection. The omentum was found extending into the hernia, and, with the exception of some broad transverse lines, it was generally reddened by inflammation. The spleen exhibited a morbid lividness, which penetrated a considerable depth into its substance. The stomach, and the tract of small intestines as far as the hernia, were greatly distended with a yellowish matter resembling fluid excrement. The large intestines were contracted and white, and it was evident that nothing had passed through the part of the ileum connected with the hernia, although merely a process of the intestine crossing the orifice entered the sac. This process was constituted of a projecting portion of the parietes, and was in the form of a semi-oval cavity, the larger axis of which, where it commenced gradually from the intestine, was about three digits in the longitudinal direction of the intestine; but the smaller axis was much less. From this commencement it progressively contracted, and extended to the depth of an inch. This portion, therefore, whether denominated a cavity or a diverticulum, was the only part of the intestine contained in the sac, with the extremity of the omentum. Neither of these parts, however, could be withdrawn, not only from constriction in the orifice, but also, in consequence of a fibrous adhesion to the sac. The sac itself was formed by the peritoneum, which protruded at the outer side of the spermatic vessels, and on each side there existed an enlarged inguinal gland. That portion of the intestine which was contiguous to the sac, but more especially the diver-

ticulum, was of a red colour, inclining to lividness; and from this part to the stomach the coats of the canal were reddened by their turgid and crowded vessels, and the mesentery presented a similar appearance.

The lungs were partially indurated, in consequence of an old disease, and adhered very extensively to the costal pleura, which, in some places, had undergone considerable thickening. The heart was flaccid.—*Morgagni*, xxxiv. 18.

Benevoli has described a hernia which was constituted of an appendix to the ileum, and extended into the scrotum. Although it communicated with the intestine by an orifice which, in the dead body, was not larger than a middling-sized filbert, yet, during fifteen days, the patient vomited every thing he took into the stomach, and, at an early period of the disease, threw up matter which resembled excrement. The intestinum ileum, to the extent of half an ell, at the part corresponding with the hernia, was not of its natural colour, and was exceedingly corrugated and contracted.—19.

CASE 3.

Scrotal hernia, with retention of urine.

A man in his fiftieth year, labouring under an enterocele, was seized with ardent febrile symptoms; and at the expiration of some days he vomited a fluid which appeared as if it were discoloured with soot. At first he experienced difficulty in expelling his urine, and afterwards he had complete retention. An attempt was made to introduce the catheter, but the effort was unsuccessful, in consequence of obstruction near the bladder: so that the patient died.

Dissection. The intestines which had descended into the scrotum were inflamed, and a small quan-

tity of puriform serum pervaded their interstices. A similar secretion was also observed in the pelvis. The bladder was distended with urine, and the obstacle to the introduction of the catheter was found to be one of the seminal foramina, which had become dilated to such a degree, that the point of the instrument was entangled in it.

Valsalva, xxxiv. 7.

It is more probable that this foramen was the sinus in the seminal caruncle.

On other occasions it has been observed, that when the neighbouring parts have been diseased, a sympathetic retention of urine has been produced. Indeed, Sennertus considered this occurrence as one of the symptoms of enteritis; and Cælius Aurelianus placed it amongst the attendants on ileus.

Morgagni, 8.

CASE 4.

Scrotal hernia; the sac thickened, and the intestine sphacelated.

A young husbandman was afflicted with a scrotal hernia on the right side, but, being reducible, he experienced no inconvenience till the thirty-first of October 1705, having omitted his truss, and eaten excessively of coarse aliment, the intestine descended, and on the same day he began to vomit bitter matter. On the fourth day, singultus, accompanied with pain in the scrotum, came on, and the retching and hiccough continued till the sixth day, when he was brought into the hospital of St. Mary de Morte. He suffered also from pain in the abdomen and from thirst. The taxis and all other expedients to reduce the strangulated intestine, were unavailing. On the eighth day he vomited a lubricus teres, one of which he had ejected before. The abdomen was tense

and resounding, but he experienced no increase of pain, even from rough handling. The frequency of the pulse increased, the tongue was dry, his urine was of a deep colour, there was some lividness about the eyes, and the countenance presented an unfavourable aspect. On the ninth day the expression of the countenance and the pulse were still worse; the former was nearly the facies Hippocratica, and the latter was more frequent and less resisting than before. His anxiety and restlessness had also increased, and he was constantly afflicted with pain in the abdomen, especially in the epigastrium. The pain in the scrotum, and in the adjacent part of the abdomen, was but slight during the few last days of his life. The matter he vomited became more fluid than it had been, and was occasionally of a yellowish colour. At length he distinguished a peculiar pulsation in the epigastric region, and a sensation of heat through the abdomen. The vomiting, as well as the other symptoms, continued during the whole night, and he died the next morning, which was the beginning of the tenth day.

Dissection. The abdominal cavity was occupied by a large quantity of fluid similar to that which had been vomited; and the stomach and small intestines, as far as the hernia, were also distended with it. Within this tract I found a worm of the same species as the two which had been ejected. The parietes of the stomach and of the large intestines were in a healthy state, but the duodenum, in consequence of inflammation, was livid to the extent of six digits, and exhaled a gangrenous odour. The jejunum and part of the ileum were inflamed, and the remaining portion of the latter, near the colon, might be said to be affected with gangrene rather than with inflammation.

The hernial sac was pyriform, and its parietes were equal to the coats of the pulmonary artery in

thickness and density. It was covered not only by the scrotum but also by the dartus, by the cremaster muscle, and by the fascia upon which this muscle is situated. The testis was beneath the sac, and the vessels adhered on the inner side, though exteriorly; and they proceeded into the abdomen near the orifice of the sac, but not through it. The aperture resembled a pretty thick ring, and was formed by the peritoneum and the circumjacent tendon; and four or five digits of the ileum, and a portion of the mesentery, had been protruded into it. The omentum, too, was converted into a round mass, at the bottom of the sac; and this mass adhered to the sac by means of a cellular membranous substance, of a reddish colour. The cells were filled with serum and blood. The intercepted intestine did not adhere, but was in a state of sphacelation, especially where it was constricted in the mouth of the sac. The ring itself participated in this lesion; and the ileum was perforated by a foramen of considerable size, so that fluids escaped into the abdomen. The edge of the liver was somewhat livid.—*Morgagni*, xxxiv. 9.

CASE 4.

Femoral hernia ; intestine gangrenous ; urethra thickened.

The subject of this case was a woman upwards of fifty years of age, who, for more than two and thirty years, had been afflicted with hernia at the navel, and in the left groin. A few days after a slight fall, by which she contused the shoulder, the bowels became extremely costive, and she began to vomit a yellowish fluid, which had precisely an excrementitious odour. The vomiting occurred at different periods, but especially two or three hours after taking food. The pulse was neither frequent nor un-

resisting, but exceedingly small. As enemata did not avail, two drams of quicksilver were administered twice. The first dose produced no effect, but subsequent to the second the patient had three dejections, the first and second of which were of a solid consistence, but the third was fluid. She died on the fourth or fifth day after the vomiting commenced. During the course of the disease no febrile symptoms were observable, nor was she convulsed: and so little complaint had been made of pain in the abdomen, that I preserved no memorandum concerning it.

Dissection. As soon as the abdominal cavity was opened the viscera exhaled an offensive odour. The jejunum and contiguous part of the ileum were distended with fluid similar to that which had been vomited, but the remaining portion of the ileum, and the whole of the colon, were contracted. Upon the jejunum some striæ of a bright red colour were observed, but other parts of this intestine, and also the ileum, were of a brownish red complexion. The ileum, to an extent of three or four digits, with the annexed mesentery, had descended into the lower hernia, where it had become gangrenous, and some bloody serum oozed from its surface. It was not adherent either to the sac itself or to its orifice. The umbilical hernia merely contained omentum.

The liver was somewhat indurated, but the spleen was flabby. The uterus was of a small size, and its parietes were thin; and there appeared a tendency in them to gangrene. The ligaments of this organ were black. The body of the urethra was so much thickened, that an inexperienced surgeon might easily have mistaken the meatus for the os uteri.

Morgagni, xxxiv. 11.

The consequences of inflammation in the two preceding instances, point out the danger of delay in such cases. They also exhibit the hazard attendant upon

administering such ponderous substances as are more likely to burst through the parietes of the intestines, when there is a tendency to mortification, than to open the natural passage, if there exists so much constriction as suffers nothing to pass till the displaced intestine is disentangled. Hoffman, indeed, relieved a woman who laboured under volvulus from a bubo-nocele, by giving her half a pound of quicksilver: and Khonius relieved a man in similar circumstances from scrotal hernia, by giving him nine ounces of that metal. The constriction of the intestine might have been less than in the former instances, and certainly it had not produced sphacelation.—13.

At the period when these cases occurred, scarcely any of the surgeons of Italy were enterprising enough to use the knife for the purpose of removing stricture, in cases of rupture. The discharge of excrement has been mentioned in some cases, even where there had been total obstruction at the strictured part of the intestine. In such instances the feces had passed the hernia before the intestine became strangulated. Sometimes, however, the constriction does not completely intercept the canal; and the following is one of those examples in which the intestine admitted of some fecal detrusion through the entire course of the disease.—14.

CASE 5.

Femoral hernia, a part only incarcerated; the sac thickened; four pulmonic valves.

Mary Franciscati, thirty-nine years of age and the mother of several children, was afflicted with a small femoral hernia, which she had been accustomed to replace herself. At length, however, notwithstanding repeated attempts for several days, she was unable to reduce the protruded bowel. She was attacked with fever, vomiting, and the other symptoms

which generally accompany this disease, with the exception that dejections were not entirely suspended. When brought into this hospital she appeared to be near death, yet she dragged on existence for several days.

Dissection. The hernial sac was thick, and easily divisible into numerous laminæ. It lay contiguous to the crural vessels, and on their inner side. It had not a narrow orifice, and all the confinement which the hernia suffered was from Poupart's ligament. Under this border of the external oblique muscle a portion of the colon was intercepted, but the incarceration had taken place in such a way, that part of the canal remained pervious. The strangulated portion adhered to the sac, and was of a black colour, and rotten; and the contiguous part, exterior to the sac, as well as the internal part of the abdominal parietes, was green. The gall-bladder was somewhat larger than usual, and, with some bile, it contained sixteen calculi. They were of a yellow colour, inflammable, and not very small.

The medullary substance of the brain exhibited numerous bloody points, and evidently contained a large quantity of blood. The left lung adhered to the costal pleura and to the mediastinum, and the thyroid gland was somewhat thicker than usual.

At the orifice of the pulmonary artery I observed that there were four sigmoid valves—one was larger than the rest, and seated anterior to them. A similar instance is recorded by I. Z. Petsche. The subject was a woman, in whom there were three large valves, and a fourth of a smaller size. Nevertheless I considered it a rare occurrence.

Morgagni, xxxiv. 15.

When hernial tumours are of a small size, they are apt to be neglected by the patient, even when pain in the abdomen is experienced. Therefore it is

incumbent upon medical practitioners to make attentive examination in such cases. When attending a young man of a noble family, who was suffering under pain in the abdomen, and neither his physicians nor myself could account for its occasional recurrence, I at length detected a small hernia, which had been unnoticed by the patient.—16.

CASE 6.

Hernia mistaken for a testis ; and hernia of the appendix cæci.

A man who at thirty years of age died from an injury of the head, appeared, during his life, to have three testicles.

Dissection. There were only two testes, and these were in a natural state. That body which appeared to be a third testicle, and was situated on the left side, proved to be a portion of omentum, which, invested with its peritoneal sac, had descended into the scrotum. On the right side also there was a tumour constituted of the prolapsed appendicula vermiformis, which was contained in a sac similar to that on the opposite side.—*Valsalva*, xliii. 2.

We have here an example of an epiplocele and an enterocele in the same individual, and some peculiarity in each. The portion of omentum which, in the living body, had resembled a testicle, must be added to those occurrences which greatly expose us to deception; and if the mistake had not been corrected by dissection, this man would have been added to those who are reported to have had three testicles. An error of a similar nature was corrected by examination after death, in another man in whom that which appeared to be a third testis was found to be an hydatid which in size and figure resembled the testicle.

It is somewhat difficult to conceive how the flexible and light appendage of the cæcum should have descended into the scrotum alone, unless we suppose that it had been greatly distended with excrement, which seldom occurs. The descent of the colon on the right side is not so easy as on the left, yet if its ligaments had been relaxed or ruptured, the appendix might have descended with the colon and cæcum, a circumstance which has happened on many occasions. The greater difficulty is, in accounting for the descent of the appendix alone.—*Morgagni*, 3.

These cases, and others which we might adduce, show that the viscera are not prolapsed in consequence of rupture of the peritoneum, nor contained within a mere process of it; but the sac is constituted of a relaxed portion of the membrane itself, and has sometimes been expanded to a surprising extent. In an infant two years, old Hommelius found all the chylo-poietic viscera protruded at the navel, and the peritoneum was not ruptured, but extended and relaxed. Mery, when describing the case of an old man, says, that in the left side of the scrotum, which was enlarged to an enormous size, he found the cæcum, with the beginning of the colon, dragged thither by the small intestines, all of which were protruded into that part except about half a foot of the upper portion. The stomach was so drawn from its situation as to descend in a right line from the diaphragm towards the lower part of the abdomen. A peritoneal sac closely embraced the whole of this very bulky rupture.

Other cases of hernia are on record in which the protruded parts extended half-way down the thighs, or to the knees; and Brebisius has represented one as hanging down quite to the calves of the legs.

Tacconus, relating the case of a maiden who had been ruptured above Poupart's ligament for many

years, says, that, at length, the intestines suddenly fell out of the rupture, not so much, indeed, in consequence of a laceration of the peritoneum as of ulceration, which also affected the integuments at the lower part of the hernia.—6.

Although I do not doubt that the peritoneum has occasionally been ruptured in hernia, I apprehend that in many of the instances in which it is reported to have happened, the deception arose from an extenuation of that membrane, and its close connexion with the common integuments. When the peritoneum is ruptured, I believe that the intestine is suddenly protruded, and that it happens from violent causes exclusively. But a laceration is not always to be suspected even under these circumstances; for large ruptures have been suddenly produced from violent causes, without any rupture of the peritoneum. There is nothing unreasonable in supposing, that either from primary formation, or from a tendency to dilatation in this membrane, that circumstance might seem to take place suddenly, to which, in fact, there had long been a disposition.

In the case of the stable-keeper related by Saltzman, I cannot hesitate to allow that the peritoneum had been ruptured. The man had previously been afflicted with a bubonocoele, and receiving a kick from a horse in his belly, the whole of the intestines were instantly protruded into the scrotum, so that this part appeared almost like another belly in magnitude, whilst the abdomen was extremely collapsed.

Riding on horseback has been regarded as an exercise likely to produce a laceration of the peritoneum, and if violent and very frequently repeated, that event may probably result from it; or it may occur from any other violent bodily exercise, as leaping, dancing, straining, or similar exertions. But these causes are more likely to occasion or to increase hernia by an extension of the peritoneum.—7.

It was formerly believed that the hernial sac was merely a dilatation of that process of peritoneum supposed to receive the spermatic vessels from the cavity of the abdomen, and having accompanied them, to expand into the tunica vaginalis. This opinion continued to be entertained even after Fernelius had clearly shown that the peritoneum was not perforated for the egress of these vessels. In many of the preceding observations made by Valsalva and myself, this idea of the hernial sac is refuted, if, indeed, it needed refutation now.

Valsalva found the sacculus lying upon the vessels, but I met with it occasionally on their inner side, and sometimes on their outer. And there is one person, if I correctly understand him, who has seen the cremaster lying between the sacculus and vessels, which I suppose to be a much more rare occurrence.

These differences of relative position which Valsalva and I have met with, and which are very necessary to be attended to by the surgeon, do not prevent us from agreeing with the most accurate observers, that the hernial sac, and the process of peritoneum, are distinct.—8.

There are other points upon which it behoves us to be cautious, lest we imagine that a portion of intestine or of omentum has been protruded, when there is no real foundation for that opinion. There are many circumstances which render incautious practitioners liable to this error. They may be deceived by the testicle, when it is descending very late into the scrotum—an incident which occasionally happens. Certainly it causes a tumour in the groin, but it cannot easily be mistaken for a bubonocoele except by those who neglect to examine the scrotum, where the deficiency of a testicle would be perceived. In children this examination is more especially necessary.

An inguinal gland enlarged into a particular form, or a cluster of glands with a deposition of coagulated serum, as was seen by Reiseleus, and other appearances of this nature, require the utmost accuracy of investigation into all the circumstances of the case.

I was at Venice when a woman sent for physicians and surgeons, and amongst them Santorini was called in, to ascertain the nature of a tumour in one of her groins. On account of its sudden appearance when she was straining to expel hardened feces, she apprehended that it was a bubonocoele. All the symptoms of hernia were absent, except that immediately upon applying their hands to the part the woman discharged wind by eructation. Santorini smiled when he observed the physicians hesitate in their judgment merely on this account, and said that whatever part of the body they might touch, the same belching would immediately come on. They made the experiment, and found it exactly as he had predicted.

When Santorini related to me this extraordinary occurrence, I recollected that Bartholin and Rhodius had observed constant eructation excited by external friction in any part of the body. The instance in which they witnessed that fact, is pointed out by Etmuller; and, in the same work, on the authority of Brechtfeld, a man is said to have been excited to eructate most violently from slight friction of any part of the body; and the eructation did not cease till the friction was suspended.—9.

There are other appearances, not only in the groins, but in the scrotum and at the umbilicus, which, though not so rare as the preceding, do not very often occur; and these may sometimes occasion physicians a difficulty in distinguishing ruptures.

I was consulted in behalf of a prince who was subject to flatulence, and to hypochondriacal disten-

tion of the abdomen, and his physicians informed me that he had an epiplocele a little above the navel on the left side. On examination I observed a flaccid and slight circular prominence, the diameter of which was at least equal to three digits. Yet as I perceived no unevenness beneath it, and as the history given by the prince himself did not confirm the sentiments entertained by the physicians, I withheld my assent to their opinions. The patient died a few months afterwards, and there was nothing found under the skin except that the cells of the *membrana adiposa* were distended with fat, which was accumulated in great quantity, and prominent in that part.

That tumours of this kind sometimes resemble bubonocoele appears from an observation of Schulzius ; and in this patient it was the more easy to be deceived, because, as he was a man of a very spare habit, nobody would have supposed that so large a quantity of fat as really existed would have been joined to the spermatic vessels. Fatty substance, too, has been accumulated in the cellular substance of the peritoneum, and being carried through the rings into the scrotum on one side only, the appearance of an oscheocoele was produced in that part.

Hernia in the scrotum, where it is often complicated, is sometimes obscured by water, which, surrounding the hernia, prevents us from distinguishing with our fingers the included omentum, or intestine, or both. Besides, we may be led to suppose a simple kind to be complex ; or, at least, to consider it that which it really is not. When the scrotum was observed so large and heavy as to weigh four or five pounds, as was observed by Vesalius, who would have supposed that it arose entirely from omentum ? And how few would have been able to avoid the deception into which Gunzius fell, and which he ingeniously acknowledges, when, seeing a tumour nar-

row and constricted at the groin, but large and extensive in the scrotum, with a rotundity of figure, he supposed that intestines were contained in it; nevertheless it only contained omentum, which had grown very thick, and was folded back at its lower part.

We have already shown, too, that sometimes the canal of the intestines is not obstructed when only a part of the parietes of the intestine is intercepted; and, at other times, this obstruction happens, although the intestine is but partially incarcerated.—10.

In the reduction of herniæ, Valsalva took the utmost care that nothing should impede the replacing of the intestine. The patient was placed in a position of body with the pubes elevated. If there was plethora he ordered blood-letting. He emptied the bowels by means of enemata, and prescribed the most sparing diet. When the intestines were replaced, he kept the patient for some time in the same position, and afterwards he carefully prevented the return by a proper bandage. When he had repeatedly attempted to replace the prolapsed parts without success, and no violent symptoms induced him to change his design, he suspended his efforts for a time, rather than create inflammation by teasing to no purpose.—11.

When it was necessary to employ the knife, Valsalva has not described his peculiar method of operating.

From his dissections as well as my own it appears that the most frequent obstacles to the reduction of herniæ are constriction or induration at the mouth of the sac, and adhesion of the prolapsed parts to the sac, or to each other. It is proper also to attend to the changes which take place in the parts, either within the sacculus or adjacent to it. That instance is exceedingly worthy of observation in which Val-

salva found the testis almost wholly converted into a membranous body, apparently from the effect of an old epiplocele. In other cases the testis nearest to the hernia has been diminished in bulk and changed in texture; so that men afflicted with herniæ sometimes become impotent, not only because the vessels adhere to the sac, as Boerhaave inculcated, but because the testes themselves are compressed by the prolapsed parts for so long a time as to impair their functions.—12.

Important errors may be committed if the changes which the prolapsed parts themselves occasionally undergo are not duly considered; and these changes do not take place in the omentum exclusively, but also in the intestines and mesentery. I have already shown that, whilst the omentum is sometimes doubled up into a rounded body, so that its nature could only be ascertained by cutting into it, the incarcerated intestine has either been inflamed, or black and gangrenous; and Valsalva met with a portion of mesentery which appeared to have become almost fleshy.

It has been supposed that in all cases of intestinal hernia the mesentery is relaxed before the rupture takes place, and sometimes to an extent that is scarcely credible. Rostius intimates that those who become afflicted with herniæ from exercise on horseback, generally experience, at first, a painful tension about the loins, which he considers as a pretty clear proof that the mesentery naturally attached there, is stretched or separated. Pain in the loins has been regarded by others among the precursory symptoms of hernia.—13.

The situation of omphalocele might excite an expectation that omentum should necessarily be found there; but although we and others have

discovered it in those herniæ, yet Rostius shows, from his own observations, and also from those of Arnauld and Petit, that frequently omentum is not included, but that a portion of the jejunum or of the colon protrudes without omentum.

The merocele, or, as it is usually designated, the femoral hernia, I have never met with except in women, but examples of its occurring in men are extant.

Some herniæ which are extremely uncommon either in their situation or from the viscera which protrude, neither Valsalva nor I have seen. Relative to situation we may adduce those which happen at the foramen ovale; and, as a still more unfrequent occurrence, those passing out at the sacro-sciatic aperture. Papen has accurately described a case of this description in which the peritoneal sac, like a large oblong bladder, contained small intestines, the mesentery (which was extremely elongated), and the beginning of the colon; and it had descended to the side of the anus. Barbetti mentions that rupture happens in the back, and if it does occur in that situation, we will reserve the name of *hernia dorsalis* to distinguish it.

Amongst the herniæ which are uncommon from the viscera protruded, is cystocele. This hernia sometimes takes place when the bladder does not fall through the groin, a circumstance noticed in another place. But there is sometimes a protrusion of this viscus at the groin, when it is not a result of malformation. Its existence under these circumstances has not only been indicated by pathognomic symptoms, but also, on several occasions, by inspection after death. Mery, who very clearly demonstrated by dissection the descent of the male bladder into the scrotum, met with a case of hernia

of the bladder in the perineum of a woman, during life. This is an exceedingly rare occurrence.

Hysterocele is a still more uncommon form of hernia than the preceding. Besides a case related in the *Sepulchretum*, and two cases published by Doringius, there are three others in which, even without dissection, no one could doubt that the uterus was contained in the hernia. Sponius and Ruysch state, that in two of them the tumour hung below the middle of the thighs, and the third, quite to the knees. The hernia being lifted up by the midwife, as witnessed by Ruysch on one occasion, the fœtuses were safely born.

Other viscera are also liable to be protruded into herniæ. Ruysch found the spleen in the dilated peritoneum; Kirschbaum has given two cases of hernia of the stomach; and, on dissection, Reiselius found the liver contained within a rupture.

In determining the seat of ruptures we should not do wrong in calling that umbilical which is not in the very ring of the navel, in which place I scarcely recollect to have seen the prolapsed part, in any other patient except a very delicate male infant. The seat of hernia may be as diversified as the regions of the abdomen. Levaterus saw a hernia in the right hypochondrium, under the spurious ribs, intercepting a portion of jejunum. Twice, on dissection, I have met with herniæ at the pubes; and they are liable to happen in other regions.—14.

Intestinal concretions.

Many calculi discharged per anum have been too hastily supposed to be engendered in the stomach and intestines, and not in the gall-bladder, because in nature and structure they appeared unlike

the usual characters of cystic calculi; and it is no substantial objection to this opinion, that some of them were of a large size. It will be shown hereafter that the biliary ducts may be greatly dilated, and the calculus, in its descent, may derive accessions of substance on its external surface. But sometimes they have unquestionably formed in the intestines themselves. In the duodenum of a decrepit old woman Chomel found, that in consequence of relaxation of the coats, a sacculus was formed which contained a considerable number of calculi. They were constituted of concentric strata; and near the centre there were radiated striæ, the interstices of which were occupied by white and shining particles. From these appearances, as well as from their external character, they might have been considered as biliary concretions, but Chomel entertained the opinion that they were generated in the bowel.

Morgagni, xxxvii. 24.

It is desirable to possess some method of discriminating between cystic calculi and intestinal concretions. Reverhorst suggested that the inflammability of cystic calculi, and their floating on the surface of water, were sufficient to distinguish them. But although this may generally be the case, its universality is confuted by the circumstance that calculi found in the gall-bladder occasionally sink in water, and do not inflame; and others formed in the intestines are suspended by water.—25.

Concretions may be formed in the stomach and in the intestines. Ballonius saw a calculus which was perforated so as to allow the more liquid feces to pass through it. It seemed to have been gradually formed by the cohesion of earthy and viscid particles in the circumference of the intestines, whilst others passing through it preserved an

aperture. Who can deny that concretions of the largest size, constituted of the same species of matter as the foregoing, had their commencement in the intestines as well as their increase? Nevertheless, after jaundice, calculi which have justly been regarded as cystic, have been voided from the intestines, many of which were preceded by pain in the right hypochondrium, extending towards the navel.—41.

There certainly is a necessity for caution lest we should mistake an alvine concretion for one formed in the hepatic ducts or in the gall-bladder. The absence of pain in the right side, and of jaundice, ought to excite our circumspection when calculi are discharged which, in other respects, appear to be cystic. Hoffman relates a case in which twenty calculi were ejected by vomiting; and as they were angular and of a considerable magnitude, although no pain was experienced in the right side, he conceived that they were formed in the intestine. Jaundice, indeed, had preceded, and was immediately removed by their ejection, therefore Hoffman suspected that they had been seated in the duodenum, at the termination of the ductus choledochus.

Three cases in which a calculus had been voided, occur to my recollection, and their globular or oval figure, their exterior and internal colour, and some other circumstances, lead to a suspicion of their having been cystic calculi; but when we read that the patients suffered griping pain in the abdomen, but not in the right hypochondrium, and that in one instance there had been oppressive pain in the iliac region, we must consider them intestinal, especially as there was volvulus in each case, and no icteric symptoms.

In another case, though the calculus was formed of concentric layers, and possessed a yellow colour

both externally and internally, yet in consequence of its not having been accompanied with the usual symptoms of the transmission of a biliary calculus, I presume that it originated in the intestine, adjacent to the entrance of bile.

That distinguished man Albrechtus has described calculi possessing a triangular figure, which floated in water, and were inflammable; and I agree with him concerning the probability of their having been formed in the colon. Beneath an obscure external yellowness they contained a solid white matter, resembling tolerably hard soap. There had not existed any symptom of jaundice, nor any pain in the right hypochondrium.

In the following case related by Brunnerus, though unaccompanied with jaundice, we must admit that the concretion had an hepatic origin. For nearly ten years a man had been afflicted with a constant pain in the abdomen, but especially in the right hypochondrium. At first it was heavy and obtuse, but, at times, it afterwards became lancinating, and ultimately was intolerable, nor did it move from the right hypochondrium. He voided light calculi, which were of a yellow colour, angular in shape, and lamelated in structure. On examination of the body three days after his decease, the gall-bladder was found to be enlarged, and to contain a mass of a deep yellow colour, inclining to blue and green, and soft in its consistence. In the middle of the cystic duct, and in the ductus communis, where it opens obliquely into the duodenum, matter adhered which was somewhat less pliable indeed, but formed by the ducts into two bodies, which, with respect to their general outline, were between an oval and a globular figure. In the colon fifteen calculi were discovered, compacted together into a globular mass, though easily separable, and not so firm as those

which had been expelled. It was evident that these concretions had begun to form in the biliary ducts, and having gradually become less soft, they were finally hardened by their lodgment in the intestines. There had been no sign of jaundice throughout the disease, but the jaundice may have been suspended in consequence of the matter being softer in the living body than on the third day after death, when it was found in the duct; and perhaps the passage of bile was not wholly obstructed; though, indeed, even when the ductus communis is obstructed there may be an immunity from jaundice. The pain might have been excited by an acrimonious quality in the bile, and not from the duct being blocked up.—45.

Neither the magnitude of calculi nor the immense number which are sometimes discharged, should always deter us from supposing them to have had an hepatic origin. They have sometimes been expelled of a very considerable size a little before death, and after that event similar concretions have been found in the gall-bladder. Vaterus has described one which resembled a little heart. It was discharged by a woman not long before her decease, and after death five similar ones, of a smaller size, were found in the gall-bladder; and from their figure it was evident that they had been attached to the larger calculus. The mother-in-law of Van Swieten had been the subject of periodical attacks of jaundice, and on one occasion, at the expiration of two days after severe and excruciating pains in the seat of the duodenum, she expelled a calculus as large as a joint of a man's thumb. There were two indentations on its surface, which indicated that two concretions remained, and which were discharged afterwards. Their size was not much less than the preceding.

Although the ducts are narrow, and the passage through them impeded by valves, yet their structure

being membranous, they can sustain almost incredible dilatation.*—46.

* The concretions which form in the intestines exhibit considerable diversity in their nature. Calculous matter is sometimes accumulated in this canal, but the occurrence is so rare that it had not fallen under the notice of Dr. Baillie. One instance occurred to me in which the concretion appeared to have been formed in one of the glands of the rectum. The patient had been excessively annoyed by irritation near the anus, and on introducing my finger, I perceived a hard body, about the size of a filbert, within the coats of the intestine. I readily divided the inner membrane, and gave exit to a calculus which possessed the qualities of calcareous substance. From its having a stercoraceous odour, I supposed that ulceration had commenced in some part of the confining membrane.

Dr. Kennedy has related the case of a woman sixty years of age, who discharged a concretion from the intestines which measured an inch and a half in length, and was $3\frac{1}{8}$ inches in circumference, and weighed 184 grains. Its chemical characters nearly resembled those of ambergris.—*Med. Chir. Journal*, Sept. 1817.

Dr. Marcet has described *magnesian calculi*, formed by the union of magnesia with an animal mucus. *Caseous calculi*, either from undigested cheese, or from portions of caseous substance actually formed within the intestines. *Oaten calculi*, which originated in a diet containing oats, and therefore observed in Scotland, but not in England. He has also described granular concretions, formed of little woody knots which are often found in certain pears; and other pseudo-concretions from different indigestible substances. Dr. Monro has also given an interesting description of alvine concretions. In most of the cases alluded to by Morgagni the concretion evidently had a bilious origin. An interesting case was lately communicated to the Hunterian Society by Mr. Newington, of Spital Square; and he has kindly permitted me to insert it. The patient was a woman fifty years of age, the wife of a butcher, and addicted to the excessive use of animal food. For two years she had experienced slight dyspeptic symptoms, on account of which she had taken pills of soap and rhubarb. Towards the end of September 1821, she perceived a hard body protruding at the anus, and which she was unable to expel. Purgatives were freely administered, and at length she expelled two concretions. One of them was of a rough globular figure, about an inch and a half in diameter; the other was about two inches in length, and conical. After expulsion they were of a rather compressible consistence. The base of the

Diseases of the mesentery.

CASE 1.

Immense fungous tumour of the mesentery, with diseased testicle.

George Marchesi, a nobleman of Forli, was afflicted with a large tumour in the abdomen, from which he suffered pain in the back, and in the left lumbar region. He had frequent micturition, and the alvine excretions were not discharged without violent straining. Although he took nourishment with an appetite, yet he became universally emaciated. The left testicle had long presented the appearance of an indurated tumour, and during the last fifteen days of his life, both feet were œdematous, and the left foot became the seat of erysipelatous inflammation.

Dissection. As soon as the abdomen was opened, a large bulk of tumour was discovered in the centre of this cavity, and it had so compressed the viscera that they were extremely contracted, and in some places, of a livid hue. The tumour was derived from the mesentery, and its anterior surface was covered with the omentum, which was extenuated, and

cone was depressed, and in this concavity it had evidently received the spherical body. The apex was abruptly narrowed, as if it had been squeezed within a sphincter. They weighed about two ounces and a half—had a saponaceous feel—and an excrementitious odour; and their colour was a pale yellow. A portion of them being analyzed, it was found to consist chiefly of cholesterine.

Calculi are not so often found in the stomach as in the intestines, but Dr. König has recorded a most extraordinary instance of a young woman who vomited and purged, at different times, a quantity of calculi which he supposed equal to five pounds. She vomited twice or three times a day, and from four to six drachms of stones, from the size of peas to that of filberts, were ejected each time. She occasionally voided urinary concretions. The symptoms indicated an affection of the bladder, kidneys, and of all the abdominal viscera.—*Phil. Trans. Anno 1681.*—*Ed.*

in many parts lacerated. When the omentum was removed, the irregular form of the tumour was more apparent ; and, at its upper part, two protuberances extended towards the hypochondria, so that one of them overspread the liver, and the other covered the spleen. Both viscera, however, were forced upwards by this mass, of disease. It weighed about twenty-five pounds, and the whole mesentery was turgid with substance of the same nature. This large tumour was connected with the diseased testicle, and the structure of these parts was the same—bearing a resemblance to the cancerous enlargement of the mamma. The texture of most of the bodies of which these were composed approximated that of glandular substance ; they were of various sizes, and, in form, resembled puff-balls. Some of them were whitish, like fat ; others were red, like flesh ; and many exhibited a blackish hue, which seemed to have originated from coagulated blood. Some of the interstices were occupied by pus, some by ichor, and in others a quantity of yellowish serum was deposited : but in no part was the latter more redundant than in the testicle.—*Valsalva*, xxxix. 2.

The extension of this tumour to the liver and spleen would tend to embarrass the practitioner in an external examination of those viscera ; and the extension of the lower appendage so as to unite it with the testis was very extraordinary.

Morgagni, 3.

The emaciation, the anasarca of the feet, and the efforts requisite to expel feces, were clearly explained by the situation and magnitude of the tumour.*—4.

* I consider this an example of fungous disease, which originated in the testicle, and was propagated, through the intervening absorbents, to the glands in the mesentery. The appendage connecting the abdominal tumour with the testicle probably was a chain of diseased glands.—*Ed.*

CASE 2.

Tumour of the mesentery connected with the kidney.

A woman, sixty years of age, for many months had complained of a tumour in the umbilical region. She then began to be afflicted with a heavy pain inclining towards the back, which was sometimes accompanied with a difficulty of micturition. Although the tumour was already as large as the gravid uterus can become, it daily augmented in bulk; and in consequence of this circumstance the pain increased, and was most severe on turning from one side to the other, when she was in a recumbent position.

Dissection. Upon the abdomen being opened a large tumour presented itself. Its base was situated in the centre of the mesentery, and was conjoined with the adipose membrane of the right kidney. It also adhered so firmly to the termination of the colon, that they could not be disjoined without laceration. In some places the structure of the tumour was firm, in others it was soft, like steatoma. The right kidney abounded with particles of sand, and its pelvis was greatly dilated; but the remaining viscera were in a healthy state.—*Valsalva*, xxxix. 5.

Unquestionably the dysuria was partly occasioned by the state of the kidney, but it must have been increased by the magnitude of the tumour, and the pressure upon the uterus, in common with the compression of the other parts contained in the abdomen.

No particular pain is referred to the tumour itself, or to those folds of the mesentery between which it was situated. In this respect the observations of the ancients and moderns coincide with the histories of *Valsalva*, though, in some of them, the tumours were numerous, and varied in magnitude, from the size of a vetch to that of a hen's egg; containing either a mucous fluid or a gypseous and stony substance.—6.

Arantius has related a case of tumour of the mesentery which exceeded the size of a child's head, and it appears to have resembled the case of Marchesi just related. He says it was formed by the cohesion of numerous enlarged glands, and was tuberoso and unequal. He denominates it an indolent tumour, and does not specify pain.—7.

Pain in the intestines certainly has accompanied this mesenteric disease; but even when other affections, yea, even abscesses, have been associated with enlargement of the glands, the mesentery itself has sometimes not been painful, nor has pain of the bowels been uniformly experienced. In some of these cases the quantity of ingesta has been very great, therefore the immunity could not be ascribed to a deficiency of excrement. However, it must be admitted that in some of these instances the patients have undergone dreadful tension and tormina.—8.

CASE 3.

Tumour of the mesentery united with the kidney.

A woman twenty-eight years of age, during four years had been afflicted with pains in the abdomen, which, occasionally, were attended with slight febrile symptoms. Her sufferings having increased, they ultimately proved fatal.

Dissection. The abdomen did not evince that tension which had been observed during life. In the centre of the mesentery two tubera were discovered. One of them, the size of a goose's egg, was situated towards the right kidney, and though ulcerated internally, it did not contain pus. The other was much larger than this, and extended to the left kidney, insinuated itself between the coats so as to cover the whole of that organ, and could not

be detached from it without the utmost difficulty. It extended also to the os pubis on the same side, its thickness in some places being equal to two digits, and in others to three. At first sight this tumour resembled coagulated blood, but the whole of it was invested with firm membranes given off by the peritoneum, and in many parts it consisted of a substance exceedingly like fleshy fibres, except in their colour, which was black, and in some places they were so flaccid as to appear nothing else than coagulated blood.

Valsalva, xxxix. 9.

I suspect that Valsalva performed this dissection when he was a very young man; and probably that which he described as a second tumour was, in reality, an aneurism. Had it been, indeed, merely a tumour of the mesentery, as he supposed, it is natural to believe that, extending to the pubis and kidney, and insinuating itself between the coats of that organ, the uneasiness excited would be protracted and distressing. Though originating in the kidney, pain very often extends to the intestines, and seems more identified with them than with the organ whence it arose. Although there is nothing in the preceding observations which clearly shows that pain existed in the tumour itself, yet I do not entertain the opinion that there can be no tumour of the mesentery which is itself the seat of pain.*

Morgagni, 10.

* Strumous enlargement of the mesenteric glands is well known to be a disease of frequent occurrence; and although it most frequently takes place in children, it is not peculiar to early life. According to the progress of disease the glands present different appearances. Sometimes even when considerably enlarged there appears but little deviation from the natural structure, but most frequently they are partially or almost wholly converted into a white, soft, and pulpy substance, which is not

Pulsating tumour in the epigastrium.

A maiden forty-four years of age, who had continued to menstruate copiously, experienced a suspension of this discharge for one or two months, and then she began to complain of itching of the palpebræ and eyes, and of palpitation of the heart, by which she was frequently attacked, though the paroxysms were short in duration. The palpitation having suddenly become more violent in degree, and continual, I was called in. To define the seat of disorder the patient laid her hand upon the epigastric region, and on placing my hand there, I perceived a large and hard body which vibrated and struck the hand with considerable impetus. Many who saw the case expressed their conviction that it was an aneurism, which occasionally doubled its pulsations, and occupied no small space in the centre of the upper and neighbouring regions of the abdomen. These pulsations did not appear to arise from the heart, for there was no vibration in the thorax, and the pulsations of the radial arteries did not deviate from the natural state, except in being somewhat accelerated. I could not accede to the opinion that this was a case of aneurism, because the pulsations in epigastrio were not synchronous with those in the wrists. Their intervals, also, and their strength,

unfrequently mixed with pus. There is scarcely any limit to the extent of enlargement, and occasionally, when there have been evident marks of a scrofulous constitution, and when the enlarged glands have been consolidated into masses of disease, the membrane itself has been found ulcerated.

The mesentery is liable to inflammation, and suppuration sometimes takes place between its folds; and I believe the glands not unfrequently become enlarged from local irritation, independently of any specific diathesis.—*Ed.*

were exceedingly unequal, when not the least alteration was observable in the action of the radial arteries. The circumstance that a kind of globular tumour is often perceived in the abdomen of hysterical females occurred to my recollection, and although these swellings do not pulsate so as to resemble aneurism, yet, weighing all the circumstances, I felt inclined to believe that this affection might be referred to the class of convulsive hysteria, whatever was its precise nature. Blood was withdrawn, and immediately afterwards she was greatly relieved; and the following day no palpitation was perceptible. At the expiration of five or six months I left the place of my nativity, but up to that time she continued free from the affection.—*Morgagni*, xxxix. 18.

The arteries which, if dilated into aneurism, may produce violent pulsation in that part of the abdomen where it was distinguished in the preceding case, are, the cœliac, with its larger branches, the superior mesenteric, the right emulgent, and the aorta. Most frequently by far, it occurs in the last, and but seldom in either of the others except the cœliac. Nevertheless, although there are so many arteries in that region, and more than a solitary cause by which they may become dilated, there are many circumstances which should render us cautious, not hastily to consider pulsation a sign of aneurism. If the body is emaciated, strong pulsation is frequently perceived in the region of the stomach and intestines, from the action of the aorta. It may also arise from plenitude of the vessels, from inflammation, or from suppurating tumours: and when the parietes are compressed by an increase of fleshy substance about the vessels, they act with greater impetus. Physicians have observed, that when the cœliac artery or the aorta has been compressed by an enlargement of the pancreas, or from tumefaction of the mesenteric glands,

vehement throbbing is perceived. It often happens, too, that hypochondriacal patients, as well as others, are affected with this unnatural pulsation.—19.

In the maiden whose case has been related it was not owing to emaciation, plenitude, inflammation, or a suppurating tumour; nor was there the least sign of any considerable obstruction of the pancreas, or of the mesenteric glands. The magnitude of the body which struck the hand, at the first view, sanctioned the opinion that an aneurism existed. From not perceiving the diameter of the vessel dilated, Albertini asserted that he had often been able to demonstrate that a strong and constant pulsation of the cœliac artery, or of the abdominal aorta, was unconnected with dilatation, but in this case the pulsating body appeared to possess considerable diameter. As a body which strikes the hand under these circumstances may either be a dilated artery or a tumour lying upon an artery which is not dilated, it is not easy to avoid deception. If the artery is of a considerable size, and is excited to vehement action by a compressing tumour, it will raise up the tumour with it, and impel it against the hand of the physician. Even in external parts surgeons occasionally are unable to decide whether the disease be aneurismal or not, from that circumstance. This difficulty existed respecting a girl who had a tumour in the neck so contiguous to the left carotid artery, that it not only occasioned stronger pulsations in the artery but seemed to pulsate with it. Yet a more attentive examination, and complete recovery, showed that it consisted of an enlarged and suppurated jugular gland. The motion imparted to a bronchocele in the same way, has led many to suppose, that the tumefaction arose from aneurism. If we are in danger of falling into an error from this cause in external diseases, how much greater is the liability to mis-

take when the lesion is situated deep among the viscera. In a case of pulsation from the navel to the scrobiculus cordis, so violent as to be frequently heard by persons who stood near, and which had continued during thirty-four years, Burggrafius suspected the existence of a spurious aneurism, and from its long continuance he had no expectation of affording relief; yet he removed it within a short period by medicines which tended to correct secretion. Tabarranus observed not only a pulsation below the epigastric region, but also a tumour as large as a fist, and this was united with other symptoms of aneurism; but after death he found a scirrhus tumour in the centre of the mesentery, adhering so closely to the large vessels that it must have compressed the aorta, and have been raised up by its pulsations. Had an aneurism existed in the maiden it must have been extensive, which could not have been formed within so short a time, or without some more violent symptoms being noticed, both before the tumour was distinguished, and afterwards; and the pulsations of the aneurism must necessarily have been synchronous with that of the arteries. Therefore I suspect that the tumour was occasioned by internal hysterical convulsions powerfully constringing, at irregular intervals, some of the intestines and the mesenteric branches of the aorta, and forming of them a kind of globular mass, distended with flatus; and at the same time the aorta was excited to more forcible action, so that it impelled the superincumbent globe.—20.

SECTION IV.

DISEASES OF THE PANCREAS.

In the Sepulchretum, cases of diseased pancreas

are related which were accompanied with vomiting; and although I have seen them united, yet other anatomists as well as myself have found this organ diseased without retching having been the consequence. Jacob Sandri informed me, that in persons who had been subject to vomitings, and especially when the humour ejected resembled the colour of tobacco, he had uniformly found the pancreas in a morbid state. The following case was communicated to me by Heraclito Manfredi.

Morgagni, xxx. 9.

CASE 1.

Tuberculated pancreas, with hydrothorax and hydrops pericardii.

A robust man was continually annoyed with efforts to vomit, but, except medicine and food, he only ejected small quantities of a watery and generally bitter fluid, and even this took place but seldom. He experienced excessive thirst, and a gnawing pain at the boundary of the thorax and abdomen. He died on the eleventh day.

Dissection. The liver appeared to be large, though its texture was healthy; and the stomach and intestines were also free from disease. The mesentery was not wholly exempt from obstruction. The pancreas was enlarged, unequal, and nearly of a cartilaginous hardness, and was universally beset with tubercles of a roundish figure, and of considerable magnitude. The thorax and pericardium contained a large quantity of bloody fluid, and the heart was extremely small.—10.

In consequence of the pancreas being deeply seated, and other viscera interposing, we are prevented from detecting tumours upon it by external examination, unless they are of a large size, and

the patient is greatly emaciated. The diseases of this viscus may excite vomiting in different ways. The stomach being exquisitely sensible, may be irritated by the hardness and ruggedness of the contiguous pancreas; or, from its increased magnitude, it may counteract the necessary expansion of the stomach, and vomiting is the natural effect of impediments to its dilatation. Large steatomatous tumours lying near it, as well as thickening in its own parietes, will have this tendency. That an enlargement of the neighbouring viscera may be an obstacle to its expansion was proved some years ago, by the premature decease of a literary man, who was afflicted with insurmountable vomiting, owing to the stomach being compressed between the liver and pancreas, which were greatly enlarged and indurated. The pancreas may also excite vomiting by pouring its morbid secretion into the duodenum, or from the succus pancreaticus being deficient in quantity. To this circumstance Hoffman ascribed the bilious vomiting which resulted from the removal of the pancreas from living dogs—an experiment which was performed by Brunnerus. The broader extremity of the pancreas adheres to the duodenum, and if this bowel should be irritated or compressed by the roughness, induration, or increased magnitude of the pancreas, vomiting may be brought on in the same way as I have supposed it to take place when the same causes act upon the stomach. A case in which there was a concurrence of disease in the pancreas and duodenum has been related in this volume.*—11.

* Vide page 25.

SECTION V.

DISEASES OF THE SPLEEN.

CASE 1.

The spleen enlarged and containing tubercles ; attended with hæmorrhage.

A flax-dresser, about twenty years of age, after enjoying good health became sickly, and had continued so for two years. He attributed this change to excessive indulgence in the amusements of hunting and dancing, conjointly with the effects of his occupation. His countenance was pallid; and, like most hypochondriacal patients, he complained of occasional slight disorders of the abdomen and thorax. In the summer of 1688 a large and hard tumour was discovered in the left hypochondrium, and he experienced a sensation of weight, accompanied with a difficulty of respiration in walking. Profuse vomiting of blood was suddenly added to these symptoms, and was attended with prostration of strength, increase of fever, and an enlargement of the tumour. The remedies employed within the first few days removed the vomiting, and afterwards the febrile symptoms; and having taken chalybeates for three successive months the tumour became softer, though it retained the same magnitude. The man's countenance was still pallid, and nearly of a citron colour. In the month of January the vomiting of blood returned twice or three times, and he was seized with acute fever—his pulse being hard and quick, though small. He had some pain, and a sensation of weight and tension in both the hypochondriac regions, and his thirst was insatiable. He died on the eleventh day after this accession of fever.

Dissection. It was astonishing to observe how small a quantity of blood remained in the vessels, so that the abdominal viscera were almost white, except the spleen, which retained its natural colour. This viscus was so much enlarged as to exceed the bulk of the liver, and it weighed four pounds and a half. There was not more firmness in its general texture than is natural, but in one or two places, beneath its convex surface, a substance the size of a large nut, and of extreme solidity, was contained. The liver was very pale, except that it was here and there marked with some red spots; but the gall-bladder was paler than the liver—indeed it was of a whitish hue, and contained a little bile, which was of an exceedingly faint colour; and some of this secretion, presenting the same appearance, occupied the fundus of the stomach. The anterior surface of the lungs exhibited a pallid complexion, but the posterior surface was black, and appeared to have been inflamed.—*Valsalva*, xxxvi. 11.

At the time when it was believed that blood might readily be transmitted from the spleen to the stomach, through the vasa brevia, the copious and repeated vomiting of blood in this young man would have easily been accounted for; but since the circulation of the blood has been better known, this fact requires a different explanation, and various hypotheses have been raised for the purpose. It has been suggested, that in consequence of the circulation through the spleen being obstructed, the vasa brevia would become dilated, and a larger quantity of blood must be directed from the celiac artery to the stomach, and effusion take place from its vessels. But in the dissections of the ancients collected into the Sepulchretum, there is but one instance of a vessel being manifestly open within the surface. In many bodies, after excessive, and indeed fatal vomiting of

blood, the stomach not only exhibited no appearance of an open or ulcerated vessel, but the vasa brevia were not dilated, though the spleen was greatly enlarged. It seems probable, therefore, that the blood had either burst into the intestines, and was afterwards conveyed into the stomach, or had flowed through the biliary ducts from the liver. Van Swieten thought that the liver was the most probable source, because, on attentively examining the abdominal viscera of a woman who died of an affection of this nature, he could discover no appearance of a ruptured vessel, nor any important lesion. In the body of another woman, who had vomited a large quantity of matter resembling grumous and putrid blood, and of which the stomach then contained a large quantity, one of the vasa brevia was observed to be almost equal to the thickness of a finger, and full of humour similar to that which had been ejected; yet the parietes of the stomach did not exhibit any conspicuous veins. The gall-bladder was enlarged, and turgid with a fluid like that with which the vas breve was distended. But, notwithstanding these observations, I do not intend to imply that blood never can burst into the stomach from the vasa brevia when an unnatural direction is given to the circulation in these parts; but certainly those instances are comparatively very few.—*Morgagni*, 12.

An instance of the spleen containing a steatomatous tubercle, the size of a nut, is related in the *Sepulchretum*.—14.

CASE 2.

Enlargement of the spleen from fever.

The subject of this case was a slender woman twenty-eight years of age, who, though married, had

not become pregnant. She had formerly been affected with chronic fever, which had left the spleen so much enlarged, that the tumefaction could be distinctly felt. Her complexion was pale, and she was still occasionally attacked with fever, which commenced with rigour, and continued for some days. For two years she had experienced amenorrhœa, and soon after its commencement, a small cutaneous ulcer arose upon the leg, and proved obstinate; and an abscess formed by the side of it. The sore resulting from this abscess had been nearly cicatrized, when, at the time the menses should have appeared, it became irritable, it extended, and discharged a larger quantity of ichor; and, on the contrary, the farther it was from the expected time of menstruation, the irritation and discharge decreased. At another of these periods, when no fresh indications of death had discovered themselves, she was attacked, early in the morning, with so much oppression about the præcordia, and anxiety at the chest, as to be compelled to sit erect in bed; and occasionally she could scarcely utter a word. She spat up a large quantity of frothy mucus, and of matter tinged with blood, and died within an hour.

Dissection. The spleen was so much enlarged as to occupy nearly the whole of the left side of the abdomen, and it weighed eight pounds and a half. The interior did not apparently differ from the natural structure of this viscus; but externally, the blood-vessels appeared to be dilated; and the lymphatics were so universally conspicuous through the coats of the spleen, as to impart to it a beautiful appearance.

The ovaries were almost entirely scirrhus, so that we could not be surprised at the infecundity. One vesicle, the size of half a filbert, was observed upon the left ovarium. It adhered firmly to the texture of the organ in which it was situated, blood-

vessels were distinguishable upon its coats, and it was filled with a brownish humour. When the contents of this vesicle were discharged, a yellow body was exposed to view. In size and figure it nearly resembled a lentil, but it adhered to the inner surface of the vesicle, so as to be scarcely prominent; and was surrounded by some minute globules. In the same ovary there were some other bodies of the same colour, but unlike the former in their shape, and not encompassed by similar spherules.

The lungs were suffused with redness, and, when cut into, a large quantity of humour resembling that which had been expectorated before death, issued from them.—*Valsalva*, xxxvi. 17.

Passing by other circumstances in the preceding case, we are reminded of those protracted fevers which so frequently leave the patient afflicted with enlargement of the spleen. Many instances, too, have occurred, in which ulceration of the legs has resulted from that organic lesion—a circumstance which has been observed from the earliest times, and the ancients said it was most likely to occur when the visceral enlargement was not accompanied with hæmorrhage. Many of my own observations, as well as numerous cases which have occurred to others, demonstrate that enlargement of the spleen is a consequence of protracted fever. The increase of magnitude is sometimes enormous. Hoffman has recorded an instance in which it weighed fifteen pounds; and Boscus, if I understand him correctly, asserts that his father met with a spleen which weighed thirty-three pounds. In these cases the diaphragm was pushed upwards, and in one instance the enlarged viscus also extended downwards to the iliac region. Preussius saw it so large in the body of an infant, that it descended from the left hypochondrium to the pubes; and Vercellonus observed even more

than this; for having descended to the lower region of the abdomen, it was reflected upwards, and terminated behind the uterus in a mass the size of a fist.

I. D. Mauchartus met with an extraordinary instance of enlarged spleen. It was of a conical figure, the base of the cone being attached to the diaphragm. In bulk it was about equal to a human head of a moderate size, and it weighed four pounds and a quarter; but the circumstance which rendered it most remarkable was, that it contained four pints of a serous fluid, within a coat resembling those of hydatids. It occupied all the interior of the organ, so that Mauchartus denominated it *hydrops lienis*.

In a case which, during the inflammatory stage, had been considered pleurisy, Anthony de Haen found the spleen distended with a large quantity of thick and white pus.—*Morgagni*, 18.

Pain is sometimes experienced in the enlarged spleen, on its being examined with the hand. At other times the pain is not perceived in the spleen itself, but at the lower part of the left side inclining towards the back. This was the case with a man who had been afflicted with other symptoms which resembled phthisis, but after death nothing morbid was discovered in the lungs. The spleen was enlarged, and converted into a very hard, heavy, and dense substance, which Vater compared to gammon of bacon somewhat hardened in smoke.

The enlarged spleen is also deceptive when it extends very widely, or when its contents are of an extraordinary nature. In the history of the Royal Academy of Sciences at Paris, an example occurs of both these circumstances existing in the same individual. The man had been afflicted with symptoms of ascites, and fluctuation was clearly perceived in the abdomen. Twice he underwent paracentesis, and pus was drawn off instead of

water; but the day after the second operation he expired. The spleen was enlarged to such an enormous extent, that, reaching from its natural situation to the ossa pubis, it covered the viscera anteriorly and laterally, and compressed them. It had contained the very large quantity of pus which had been drawn off during life. Although I have already intimated that water and pus have been found in the spleen, I do not remember any instance in which so large a quantity of pus had been accumulated in this viscus as in the instance just referred to; and the only circumstance which could have induced a suspicion that the spleen was the seat of lesion, was, that the disease had succeeded a quartan ague of eighteen months' duration.—*Morgagni*, lxx. 10.

The spleen has sometimes been surrounded by a scirrhus mass of omentum, occasioning a tumour in the left hypochondrium resembling a scirrhus spleen.

Morgagni, xxxvi. 21.

We must guard against being misled by appearances occasionally observed on the spleen, and which some have reported as the result of disease, though they had existed from original formation. This, I believe, has occurred from fissures on the spleen, which have been described as incisions; and the same thing has happened respecting natural fissures of the liver.

Various circumstances occur in medicine which should render a physician cautious in his diagnosis, as well as circumspect in his practice. The following case of enlargement of the spleen tends to sanction this remark.—28.

CASE 3.

A man of a slender habit of body was confined in this hospital under various diseases, and one among them was a tumour in the left lumbar region,

where this district begins to terminate beneath the lowest rib. Sometimes the tumour appeared smaller than at others; but the tumefaction was never very apparent to the eye, and it yielded to the hand as if it contained a fluid. At length the man sunk beneath this complication of disease.

Dissection. When the abdomen was opened it appeared that the spleen was tumid, and of a soft texture; and reaching to the part where the enlarged substance was distinguished, had occasioned more or less tumefaction according to the degree of distention of the stomach and intestines. An inconsiderate practitioner might easily have been imposed upon by the circumstances of this case, to the essential detriment of the patient.*—*Morgagni*, xxxvi. 29.

Ossification of the spleen.

Partial conversion of the coats of the spleen into

* The spleen is not only liable to enormous enlargement, but also to surprising extenuation. This fact is shown in the first case of diseased liver. It is not very uncommon to find the spleen extremely soft, and it has occasionally been converted into a morbid mass, having scarcely any vestige of organization.

Dr. Yeats has related an instance somewhat of this description. The patient was a female, forty-one years of age, and the symptoms were ambiguous. In February 1816 she complained of restlessness, chilliness, thirst, sickness, and loss of appetite. In the commencement of 1817 she appeared better, but was suddenly seized with sickness, and vomiting of yellow bile, accompanied with fluid dejections, and some griping. She felt extremely faint, the countenance became ghastly, she had some tightness across the epigastric region, and died on the 28th of February.

Dissection. The abdominal fat was three inches thick, the stomach was inflated, and its villous coat unusually vascular. The liver was healthy, but its anterior lobe adhered to the diaphragm. The spleen was smaller than usual, exceedingly soft, being, in fact, a mass of gore. The lower intestines exhibited much inflammation.

Hydatids have occasionally been found in large quantities in this viscus; and it has been the seat of tubercles, some of which were distinctly scrofulous.—*Ed.*

cartilaginous substance has been frequently observed, and also the deposition of calcareous matter. Nor are observations wanting in which calculi were found in the substance of this viscus. In the Sepulchretum a calculus the size of a chestnut, the weight of two ounces and five drams, and formed of laminæ like egg-shells laid close upon one another, is said to have existed in the spleen of a young woman; and others are mentioned in which the spleen contained numerous calculi. To the Royal Academy of Sciences at Paris, Littre exhibited a spleen in which not only the exterior coat had become bony, but the entire substance. It was taken from the body of an old man, and, it may be observed that ossification occurs more frequently at an advanced period of life than in young persons. In the museum of this university we have a similar preparation which was taken from a body publicly dissected in the college, before the beginning of the present century.

Morgagni, xxxvi. 14.

I shall give a description of this spleen, so far as information can be obtained by external inspection. It is seven digits long, and four in diameter at its broadest part, and, at one extremity, two digits. In one place it is as thick as the little finger, in some places half that thickness, and in others, especially at the borders, it is much thinner. It is of an irregular figure, and curved longitudinally. Its surface is unequal and tuberoso, but this appearance was more obvious on its convex surface than on its concave. Almost every where about the edges are to be seen the dried remains of the membranous coat, and these relics may be traced to each surface, but more particularly to the concave. This surface is still evidently invested with its membrane, and therefore presents a brownish yellow complexion, whilst the convex surface is of a whitish yellow

colour, with the exception of some places where the membrane remains. The spleen had adhered very closely to the diaphragm, and it is probable that when pulled away the membrane was partially torn off from the convex surface, and left attached to the diaphragm with some lamellæ of the calcareous substance. It is probable that to this cause some oblong breaches and foramina are attributable, for there is scarcely any such appearance on the concave surface, nor the least trace of those parts at which the vessels entered. Looking upon these apertures it is evident that the spleen in question is not universally solid, but vacant cells are discoverable in many places, and the spleen does not weigh more than ten drams. It was taken from the body of a porter, not advanced in years, who had suffered dreadful pain in the region of the spleen. Vallisneri senior, distinguished this as a specimen of ossified spleen; and the protuberant parts of the concave surface certainly appeared to be bony, but the opposite surface seemed of an intermediate nature between osseous and calcareous substance.—15.

I have often met with instances of ossification of the coats of the spleen; and I have now a specimen under examination, in which a portion of membrane four digits in length and two in breadth, entirely converted into laminæ, was taken from the human spleen. They appeared very evidently to be osseous. In the interstices of these laminæ, though partially growing out of them, small tubercles arose upon the outer surface; but larger tubercles, whose superficies were unequal and granulated, descended about half a digit into the substance of the spleen. Their nature appears to be between that of bony and calcareous substance.

The spleen in the college museum shows that os-

sification does not invariably commence in the capsule of this viscus.*—16.

Prolapsus of the spleen.

I am indebted to Manfredi for the following case.

A man had swelling in each inguinal region. That on the left side was occasioned by hernia, and proved fatal by producing ileus.

Dissection. When the abdomen was opened the spleen was discovered in the right groin, and could

* Laminæ of calcareous matter in the capsule of the spleen are not unfrequently seen, but calculi within its substance are more rare. In addition to the cases related by Morgagni I shall only cite one which is of recent occurrence, and in which the deposition had taken place to a great extent, and under some peculiarity of form. The case is related by Mr. Bampffield. The patient was a man who had been a drunkard, and died from hydrothorax and hydrops pericardii; and although the symptoms chiefly arose from these dropsical effusions, he underwent severe affections of the stomach, which were attributable to the mechanical pressure of the mass of disease within the abdomen, and which is thus described. "From the centre of the substance of the right end of the spleen arose a spherical bony tumour, resembling in size and figure the head of a fœtus seven months old, which at its right hemisphere was attached to the left lobe of the liver, which it had stretched and elongated. The long diameter of the tumour is three and a half inches, the short three inches. Its largest circumference was eleven inches; and the average thickness of the bone is one line, and is covered in many parts with cartilage of various degrees of thickness. The tumour is hollow, and contained seven ounces of a fluid chiefly serum, in which were floating small particles of a ceteaceous substance shining like mica. Its external covering or periosteum appears to be an elongation of the peritoneal covering of the spleen, where it is not enveloped by the substance of that viscus; and its internal lining appears to be a secreting membrane proper to itself; one half of its external surface is covered by the substance of the spleen, the other by peritoneal membrane, and, generally speaking, by cartilage. The left lobe of the liver was united to the latter portion of the tumour. The urine had been coagulable."—*Med. Ph. Journal*, Jan. 1821.—*Ed.*

not easily be removed from the adjacent parts. It weighed about three pounds, was about five digits thick, twelve digits in length, and as many in breadth. It was connected to the stomach by a kind of cord, two inches in thickness, and concealed under a portion of intestine. This chord was made up of blood-vessels invested with a thickish coat, so that, in its colour, and in the contortion of its vessels, it resembled the funis umbilicalis. Externally it had some appendages, which, perhaps, were the remains of lacerated membranes, and, at first sight, resembled the adipose appendiculæ of the colon. The branches of the splenic vein were exceedingly dilated, and one of the vasa brevia would easily have admitted the forefinger.—*Morgagni*, xxxix. 42.

Blasius and Ruysch published a case of prolapsed spleen, in which the splenic vessels were surprisingly enlarged both in length and diameter.

In the production of this displacement the weight of the spleen must have considerable effect in elongating or rupturing the membranous bands which connect it to the septum transversum; and most observers have either distinctly mentioned, or have hinted at an augmentation of bulk in connexion with prolapsus. But when we recollect those examples of enlargement in which the spleen had not departed from its natural situation, we must perceive that other causes besides weight are requisite to explain this fact. There may exist some relaxation or weakness of the ligaments, or the patient may have fallen from an eminence, at the time that the spleen was enlarged. I do not recollect any author who has described the funis of the splenic vessels with so much accuracy as Manfredi.—43.

We cannot suppose that any peculiarity would appear in the symptoms of prolapsus of the spleen. At the earlier period its loose descent through the

abdominal cavity may be worthy of observation; but in process of time it may become immoveable in consequence of adhesion to the adjacent parts, as in the case which I have related on the authority of Manfredi. Ballonius found the spleen lying upon the bladder, and united to it. Riolanus asserts that he had seen four instances of this displacement, and he particularizes two in which the spleen adhered to the uterus.

Should we observe a protuberance in the left hypochondrium, extending into the epigastric region, and after some time distinguish it in the hypogastrium, accompanied with an emptiness in the former situation, we may entertain a pretty confident opinion respecting its nature. But although the spleen readily contracts adhesions, we are not to suppose that an enlarged body within the abdomen, which other circumstances indicate to be a prolapsed spleen, is not that viscus, should it continue loose for a very long period; for in the example from Blasius, which has been referred to, the spleen was pendulous and moveable, though the tumour had been perceived three years and a half. From the testimony of Ruysch it appears, that this affection may arise after difficult parturition, and be accompanied with excruciating pain.

A case is related by Anthony de Pozzio, in which the enlarged spleen had removed from its natural situation in consequence of its weight, and occupied the hypogastrium; yet the woman survived twenty-four years, and bore three children within that period.

In the course of my reading I have only found ten instances of prolapsus of the spleen, and have never met with it in dissection. Six of the ten cases alluded to were in females, two in men, and in the remaining two, the sex of the patients was not mentioned.—44.

I have intentionally omitted those cases in which

the spleen was so much enlarged as to extend from the hypochondrium into the hypogastric region.

Removal of the spleen.

Fantonus has related a case in which the spleen was removed in consequence of an abscess which formed and was opened at the umbilicus. The patient had complained of violent pains, especially below the left hypochondrium. The spleen had descended to the navel, and was extracted, and the woman survived its removal five years, within which period she became pregnant, and underwent parturition. On examination of the body after death, cicatrices were observed on those parts to which the spleen naturally adheres, but there was no appearance of a spleen.—*Morgagni*, lxx. 10.

SECTION VI.

DISEASES OF THE LIVER.

CASE 1.

Enlargement and tubercles of the liver; extenuation of the spleen and pancreas; and flaccidity of the heart.

A priest of the order of St. Austin, somewhat more than forty years of age, after close application to study, and considerable fatigue of body, began to perceive a degree of tension in the right hypochondrium: and no other symptom manifested itself for some months. At length frequent vomiting supervened about four hours after taking food, and other symptoms came on. During the last months of his illness the abdomen was extremely hard, especially in the right hypochondrium, but no pain was excited by compression. On the contrary, pain spontane-

ously arose in the left hypochondrium, and was particularly violent during the process of digestion. Matter was sometimes vomited which was tinged of a tobacco colour, but at other times it was brown or black, or of various hues, and contained flakes which resembled portions of membrané. After taking some aloetic pills excessive vomiting occurred, and from that period all the symptoms were aggravated. The pulse had previously been obscure, but now it became greatly more so; fever arose, and the urine resembled that of an icteric person. Within a few days, the feet being œdematous, and the pulse imperceptible; and life was closed without any considerable difficulty of breathing, or any perturbation of mind.

Dissection. The liver was exceedingly large, and was full of steatoma; and the structure in their interstices resembled the thymus gland when boiled, white, lobular, and hard. The gall-bladder contained nine calculi, with some bile having a livid tinge. The spleen was so small as scarcely to exceed the size of a silver crown; and the pancreas was so much extenuated that at first it was supposed to be wanting. The inner surface of the stomach was diversified with black spots. The pylorus was callous, and could not yield so as to admit of adequate dilatation; but the remainder of the stomach was flabby.

The thoracic viscera were flaccid, and there was such excessive laxity in the heart, that the muscular tissue could be drawn into pieces with the fingers.

Morgagni, xxx. 14.

This case occurred at Bologna about the beginning of December 1703.

It is most probable that the spleen had been very small originally; or its size, and that of the pancreas, might have been diminished in consequence of an increased quantity of blood having been diverted from the splenic artery into the liver; or from their being

compressed by the enlarged and indurated liver. Whatever might have been the cause, it is evident that the secretion and dilution of bile would be unnatural. But the quality of the bile would be more especially altered by the morbid condition of the liver. The colour of the bile, as well as the calculi, demonstrated that this secretion was unhealthy. In consequence of these circumstances, the quality of the chyle and of the blood would be altered, as well as that of the secretions which take place from the blood, especially those eliminated in the stomach, intestines, and pancreas; and the phenomena which attended the case are clearly explained. From the diversity of morbid secretions, their combinations, and detention, it is not surprising that the matter ejected by vomiting presented a variety of unnatural colours.—15.

CASE 2.

Enlarged and tubercular liver; ascites; central contraction of the stomach; coats of the gall-bladder thickened.

A woman forty years of age, whose complexion was yellow, had long perceived some hardness in the right side of the abdomen, descending below the os ileum; and pressure on this indurated part excited pain. She was thirsty, and for a month previous to death she complained of pain in the stomach after taking food, and breathed with difficulty. On some of the latter days of her life vomiting came on; and during the last two days the pain was exceedingly severe.

Dissection. The abdomen was full of a yellow fluid, which had a bitter flavour, and coagulated when exposed to heat, like serum. The stomach was so contracted in the centre, as in some measure

to represent two stomachs; and the aperture between them resembled the pylorus. The liver was excessively enlarged, so that its right lobe extended nearly to the bottom of the abdomen. The substance of this lobe was universally indurated, and in many places it was beset with whitish bodies, the largest of which were equal to the size of a filbert. When cut into, some parts of the liver exhibited the commencement of ulceration, and beginning putrescence of its secretions. The left lobe was also indurated, and pressed upon that part of the stomach which was so greatly contracted. The coats of the gall-bladder were thickened, and its cavity straitened. It contained thick and viscid bile, of a black colour.

The lungs were rather white, though variegated with spots of a blackish hue; the left lung was somewhat adherent at the back, but the right was entirely free.—*Valsalva*, xxxvi. 2.

I have already described the central contraction of the stomach, but in none of those cases was the constriction so great as in the instance just related. In a case which occurred to Blasius, indeed, it exceeded this; and the man enjoyed good health, but was afflicted with extreme hunger. I have already expressed an opinion that this appearance in the stomach was coeval with the formation of the body; but in this case it seems to have been increased by the compression of the indurated liver; and the vomiting, and the pain in the stomach arose from that circumstance. It is consistent with reason, that the functions of the stomach must be greatly deranged when that viscus is either compressed or forced downwards in consequence of the bulk of the liver being increased; and the correctness of this opinion is demonstrated by numerous observations. It is true that the healthy liver occasionally extends its thinner part quite to the spleen; but when it is

diseased there is scarcely any limit to its extension through the abdomen.—*Morgagni*, 3.

CASE 3.

The liver enlarged, scirrhus, and tuberculated, with ascites.

A porter apparently about middle age, who had never been the subject of any disease, felt considerable uneasiness in his loins immediately after lifting a heavy weight. He was confined to bed for two days, and throughout the remainder of life he was unable to lift the weight of twenty pounds without pain. About a month after the accident he perceived something like fluctuation in the abdomen when he turned in bed, and soon afterwards he distinguished a hard body apparently ascending from the hypogastrium into the scrobiculus cordis. In the fifth month after the accident he came into the hospital. He had continued fever, although slight in degree, but it underwent exacerbation at night; and a tumour could be felt in the scrobiculus cordis, and beneath the lower ribs, especially on the right side. It was also evident that the abdomen contained fluid, and the accumulation progressively increased, so that at the expiration of a month this cavity was greatly distended, and scarcely any internal tumour was perceptible, except at the scrobiculus cordis. The tumour was exceedingly hard and unequal, but was not painful, even on pressure. The patient was not distressed from its weight, nor was he molested with cough, but he was somewhat thirsty. His face was rather pale, but not yellow. He generally lay upon his back, but he could avail himself of decubence on either side. Although his respiration was not perfectly free, yet there was no considerable difficulty in the performance of this function. He died in April 1745, about fourteen days after I saw him.

Dissection. The body was emaciated, and nowhere œdematous except slightly in the feet and scrotum. The abdomen contained a large quantity of a pellucid fluid, of a yellowish colour. The omentum was retracted into the left hypochondrium. The stomach was small and contracted. The spleen was whitish externally, and double its usual size; and internally it exhibited some rather white but not indurated substances. The liver was so much enlarged, that the persons who were present supposed its weight to be about fourteen pounds. It occupied the whole upper region of the abdomen, and had extended so much towards the left side that the umbilical fissure was situated on the left of the cartilago ensiformis. The whole of this viscus was indurated, and in several places it exhibited elevated tubercles, of a yellow colour, and an inch in breadth. The remaining structure of the liver was pallid. With the exception of a few intermixed portions of hepatic substance, the internal texture of the liver consisted of a substance which could not be divided more easily than the mammary gland. This substance was of a yellowish white colour, and, when compressed, it emitted a kind of purulent ichor. The gall-bladder was exceedingly small.

Morgagni, xxxvi. 25.

It is unquestionable that, as the enlargement and disorganization of the liver advanced, the quantity of fluid effused into the abdominal cavity became more redundant. The circulation of blood through the vena portæ, and the inferior vena cava must have been impeded; and many lymphatics would be compressed, and some perhaps ruptured, whilst the patient lay in the supine position. If, however, we suppose that these vessels were uninjured, an excess of fluid would be deposited in the abdominal cavity, from mere congestion of blood.

The scirrhus state of the liver also contributed to this effect. The bile secreted must have been unsuitable for its natural purpose, and the smallness of the cyst indicated that there was a deficiency in its quantity. Neither healthy chyle nor healthy blood could be prepared under these circumstances. This effect would the more certainly ensue in consequence of the spleen being diseased; for although unable fully to determine what is the office of this organ, we cannot doubt that, in general, it conduces, in some measure, to the formation of both chyle and blood. The liver and spleen receive their arterial blood from one source, namely, the cœliac artery; and whenever one of these viscera becomes so tumid as to admit a smaller quantity of blood than usual, a redundancy will be determined to the opposite viscus. And as the liver receives its venous blood partially from the spleen, when this is diseased the blood transmitted to the liver will not possess qualities suitable for the secretion of healthy bile.—26.

CASE 4.

Enlargement of the liver and spleen—ossification of the mesentery—four renal arteries, and a diverticulum on the intestinum ileum.

A woolcomber about forty years of age came into the hospital at Padua, on account of disease in the hypochondria. The colour of his face was unfavourable, and, for a year, his health had been impaired. He had slight febrile symptoms; and on examining both hypochondriac regions with the hand, the existence of disease in those parts, especially in the right, was confirmed. After seeming to derive some advantage from the means employed, acute fever came on, accompanied with symptoms of thoracic inflammation, and he was carried off in ten

or twelve days. In January 1746, two days after death, I dissected the body.

Dissection. The abdominal muscles were flabby, and presented a somewhat greenish aspect. The liver was excessively large, and internally of a pale brown colour. When attentively examined, it was observed to be diversified with black spots throughout its interior structure, as well as on its surface; and also was indurated. None of the sections of the liver exhibited any yellow points, and there was a very small quantity of bile of a cineritious colour in the gall-bladder. The spleen was twice its usual size, and its artery was not tortuous.

Attached to the mesentery we found a body the size of a small cherry, uneven and granulated upon its surface, and of an intermediate nature between osseous and calcareous matter. On the intestinum ileum there existed that kind of appendix or diverticulum which has been described when writing on hernia. The coats of the left external iliac vein were thickened. The renal arteries were about nine digits in length, and two were distributed to each kidney. The upper originated at the usual place, and the lower at not more than an inch above the division of the aorta into iliacs. That part of the substance of the kidneys which constitutes the anterior paries of the sinuses was entirely wanting.

The right lung was indurated, and attached to the pleura. Some spoonfuls of bloody serum were contained in the pericardium, and two veins on the surface of the heart were turgid, and, in a degree, varicose.—*Morgagni*, xxxvi. 23.

If the splenic artery was not without inflections naturally, we may suppose that their obliteration was owing to this vessel receiving an increased quantity of arterial blood, in consequence of the current of arterial blood through the liver being obstructed.

The compression of the small arterial branches, when the liver is obstructed, is not only evident to reason, but is sometimes demonstrated by facts. Vulpius assured me that he had twice found the trunk of the hepatic artery so dilated in a case of obstructed liver, that he could introduce his thumb into its cavity.

When there exists this disease in the liver, the constitution readily becomes cachectic; and if there is much organic lesion, the body has not only a tendency to cachexy, but also to dropsical effusion.—24.

In the bodies of cachectic persons I have often observed the cortex cerebri very pallid, and the medulla much whiter than usual; in consequence of some of the blood-vessels being empty.—13.

CASE 5.

Induration of the liver, and an abscess communicating with the thorax; with hydatids and ascites.

A woman sixty years of age complained for a long time of pain above the umbilical region. She was thirsty, and, by coughing, she expectorated mucus. Ultimately, her respiration was difficult, and a few days before her decease, the abdomen suddenly became exceedingly tumid, and the feet œdematous. At length the pain gradually ceased, and she died.

Dissection. A large quantity of limpid fluid occupied the abdomen, but no vestige of lymphatics was discovered. The spleen was enlarged to twice its usual size. The liver was indurated, and the gall-bladder was full of smooth calculi. At one part of the liver a congeries of vesicles was observed adhering to it, and serum issued from them when they were lacerated. Within the substance of the liver,

and in the part turned towards the diaphragm, the cavity of an abscess was found, which occupied more than a third part of the viscus. The matter formed in the abscess had perforated the diaphragm, and burst into the right thoracic cavity, which was full of pus, although the lungs were healthy.

Valsalva, xxxvi. 4.

Stalpart has related a case in which the diaphragm was consolidated with the liver and lungs, and having become perforated by a fistulous opening, in consequence of an abscess in the liver, a small quantity of matter escaped into the lung. I do not recollect any author who has described an instance parallel with that of Valsalva or this of Stalpart.

Morgagni, 5.

Syncope and sudden death have frequently resulted from the rupture of abscesses in the liver, though in scarcely any of the twenty cases of abscess in this viscus, published in the *Sepulchretum*, were these circumstances observed. Amongst other physicians, these results were noticed by my preceptor Albertini; and he urged practitioners not to suffer patients to be moved, in whom there were symptoms of an abscess in the liver, because he thought it probable that, by preserving the body in a state of quietude, the pus of an abscess ruptured without injuring the membrane of the liver, might escape into the intestines through the branches of the biliary duct. He foresaw that by a contrary practice the external membrane of the liver might be so ruptured, that the accumulated matter would be poured into the abdominal cavity, and destroy the patient instantly, by producing syncope. When he was a young man, an eminent surgeon, following the practice recommended by authors, prescribed exercise to a maiden who was afflicted with suppuration in the liver: the pus was effused into the abdomi-

nal cavity, and the patient died soon afterwards in the arms of the women by whom she was supported. He afterwards observed the same event happen independently of motion, or with only the slight motion of turning in bed, or in rising from it.

Two cases of abscess of the liver opening externally, occurred at Bologna, and in one of these the patient recovered. The matter discharged, in the other instance, sometimes resembled bloody water, and at other times it was somewhat yellow. In consequence of not sufficiently regarding the preceding jaundice, and other symptoms of diseased liver, and being deceived by the touch, the physician and surgeon considered this an abscess seated in the abdominal parietes, and treated it accordingly.—6.

The vesicles adhering to the liver, mentioned in the woman whose case led to these remarks, were hydatids; which frequently adhere to the diseased liver : and the quantity of limpid fluid accumulated in the abdomen might have originated from the bursting of the larger vesicles.—7.

Vesicles have often been found within the substance of the liver; and Vallisneri has described bladders or cysts, pregnant with smaller vesicles. Valsalva not only found vesicles in encysted tumours of the liver, but in one case the liver was wholly made up with them.—9.

In the third letter of the *Epistolæ Anatomicæ*, Valsalva has detailed several cases of abscess in the liver, and one of them particularly interested Malpighi. The biliary duct communicated with the abscess by a large orifice, and was dilated throughout, so that it was evident how it might take up vesicles from the cavity of an abscess, and convey them into the duodenum. We have no reason to doubt that this duct frequently transmits blood and pus from

vomicæ of the liver into the duodenum. In a girl who, at different periods, had voided many pounds of a purulent fluid, the biliary ducts were much dilated, and the extremity terminating in the duodenum was large enough to admit a little finger. A considerable quantity of pus was found, after death, in the intestines, the biliary ducts, and liver.—10.

A tumour has been observed in the right hypochondrium, from a scirrhus which adhered closely to the ileum and colon; and the liver has been urged towards the left hypochondrium by an excessively dilated colon pressing against the ligaments of the liver. In a case of ulceration in the mesentery, beneath the liver, the patient suffered pain which was imputed to the liver itself.*—21.

* Many cases of abscess in the liver bursting into the lungs have occurred, and when we consider the natural connexion of the liver and diaphragm, and the morbid adhesions which result from inflammation, we cannot be surprised that the septum should be perforated in consequence of an abscess in the liver.

It has justly been intimated by Morgagni, that hydatids are found attached to the surface of the liver, and also contained within its substance. Most frequently they occupy the latter situation, and are surrounded by a cyst which is laminated, and almost of a cartilaginous hardness. Sometimes they pass through the biliary ducts, as Morgagni has hinted, or they may escape from the liver under all the other circumstances of an abscess. They have been known to pass through the diaphragm, and even to be expectorated.

The liver is not only liable to undergo enormous increase of bulk, but sometimes it becomes diminished. Dr. Martinez has given an instance of this circumstance in a boy fifteen years of age, who had been afflicted with abdominal pain, diarrhœa, and jaundice. The liver was one third less than usual, softened, and reduced to pulp. Its structure somewhat resembled that of the spleen, but was of a rhubarb colour.—*Med. Rep. March 1820.*

I found it, on one occasion, considerably reduced in size, but the disorganization was different, at least in colour, from that in the preceding case. The whole interior structure was occupied by three or four tubera of the nature denominated tubera diffusa. But the most remarkable circumstance was, that instead of its

On jaundice and biliary calculi.

CASE 1.

Jaundice from an affection of the mind.

A young priest was seized with jaundice a short time after some mental perturbation. It was accompanied with pain at the region of the stomach, and he frequently vomited both food and medicine. After one or two days he became restless, and manifested such a degree of hebetude as to forget every thing related to him. The physician who attended him did not observe any fever till the third day, when it discovered itself with extreme severity, accompanied with violent convulsions, so that the struggles of the patient nearly overcame the strength of his attendants. Besides these symptoms he vomited a darkish coloured matter. In the morning a vein was opened, and the blood issued from it with some impetus; and the serum which separated from the coagulable part tinged a piece of linen dipped in

usual lobular and fissured appearance, it was perfectly oval, and the coat almost entirely cartilaginous. In some parts the thickness of this coat did not exceed a line, but in others it was nearly half an inch. I could discover no appearance of either gall-bladder or biliary ducts. The man in whom this liver was found was advanced in years, and had been greatly addicted to drinking. He became ascitic, and before his decease, hæmorrhage repeatedly took place from the villous coat of the stomach.

The truly scrofulous tubercle, I believe, has seldom been seen in the liver. I have met with one instance of a rather large tubercle, which contained that kind of thick and curdy matter which generally indicates strumous disease.

Dr. Bayle describes the liver as sometimes becoming yellow, large, and fat, in some cases of phthisis.† Indeed he says that, occasionally, it is not only greatly enlarged, but almost transformed into fatty matter.—*Ed.*

*It is related of several that after
suffering a little from the disease of
the liver, they have been cured by the use of
the following medicine.*

it, of a yellow colour. The convulsions ceased, but the patient lay in a state of coma, scarcely moving himself; and, on being cupped, he did but just evince that he felt the glasses. Respiration was natural, except being occasionally suspirious. He died on the beginning of the fifth day.

Dissection. The liver was flaccid, and rather pale; the gall-bladder contained bile of a somewhat dark colour; and the stomach was occupied by matter similar to that which had been ejected within the latter days of his life. Some red points were dispersed on the inner surface of the stomach, about the left orifice. In different places throughout the abdomen, there were numerous minute glands turgid with blood.

The lungs were tumid with air, and unconnected with the costal pleura except on the left side, where some small membraneous bands united the lung and pleura. The pericardium contained a small quantity of serous fluid.

When the dura mater was divided, serum escaped from beneath it, and in the interstices of the vessels which ramify through the pia mater a small quantity of a kind of gelatinous concretion was observed. The cerebrum was extremely soft, and probably a little tinged with bile. When the medulla spinalis was cut through, at the upper part of the vertebral tube, a serous fluid distilled for a considerable time, as if it had flowed from a divided absorbent vessel.

Valsalva, xxxvii. 2.

The influence which passions of the mind exert in producing jaundice, is demonstrated by numerous observations. This fact will not surprise those who consider how greatly the nerves are affected by mental emotions, and how powerfully the same nerves affect the sanguiferous and excretory vessels, and all the discerning organs; and consequently, how

much they impede and vitiate the secretion and excretion of humours. If we suppose that in some persons the hepatic nerves chiefly sympathize, or, if others are also affected, that the vessels of the liver and its secretory functions yield most readily to the action of the nerves, we shall immediately understand why jaundice arises in them from passions of the mind. Concerning a woman subject to jaundice under these circumstances Hoffman says—*Quoties ob prægressam animi commotionem, . . . novi accedebant insultus febriles, protinus icterus cum omnibus revertabatur symptomatibus.*—3.

CASE 2.

An intelligent young man, devoted to literature, and set apart to the priest's office, was exceedingly terrified by a savage fellow presenting a musket to his breast and threatening to shoot him. The following day he became icteric, and soon afterwards delirious, so that he knew none of his acquaintances. He was subsequently affected with convulsions, so violently that several persons together could scarcely hold him, and he died within twenty-four hours from the commencement of delirium.

Dissection. The examination of the body developed nothing worthy of remark, except that the blood-vessels distributed through the pia mater were mostly distended with black blood.

Morgagni, xxxvii. 4.

Jaundice seems to have been occasioned by an affection of the hepatic nerves; and the matter of the bile being retained in the blood, and greatly affecting the brain, appears to have brought on all the other symptoms.—5.

In one of the cases recorded in the *Sepulchretum*, the patient had scarcely a perceptible degree of

fever at first, but it afterwards became more violent, and the patient was seized with delirium. He afterwards experienced a fresh accession of fever, violent tossings of the body, two epileptic paroxysms; and three days before death, convulsions supervened. The liver, and nearly all the other parts of the body, were exceedingly yellow.

In the same work is detailed the case of a young man who, from possessing a lively and pleasant disposition, became morose and melancholic, and was suddenly affected with jaundice. Fifteen days afterwards he was unexpectedly attacked with violent convulsions, grinding his teeth and howling, and he died under these circumstances. No cause of death was discovered in the brain. The lungs were considerably diseased, but the principal lesion was in the liver, which was of a greenish colour, or rather pale, so that it coincided with the appearance of the liver in the priest whose case is related from Valsalva.

The cause of delirium may be seated in the brain, though it may elude observation; and from nervous irritation exterior to the brain, or from irritation of the medulla spinalis, horrible convulsions may ensue. In the priest we must suppose this effect was produced in that way.—6.

Valsalva supposed that the brain of this patient had been tinged by the bile. Although occasionally found yellow in this disease, I do not remember to have read many instances of its occurrence. Perhaps this infrequency is attributable to the extreme minuteness and paucity of the vessels distributed to the internal substance of the brain. Some time ago, when, as usual, I had a considerable number of heads in the theatre, for the purpose of giving the anatomical demonstration of the brain, I observed that, with respect to one of them, not only was there yel-

lowness of the *membrana conjunctiva*, and the face, but also of the skin in other parts; and I found that it was the head of a man who had been afflicted with asthma and jaundice, and who died the preceding day. Through the *pia mater* I noticed several extensive spaces which presented a greenish yellow colour, yet when the brain was dissected, its colour was perfectly natural. A similar opportunity of observing this circumstance occurred afterwards. The small quantity of fluid in the lateral ventricles was somewhat yellow, and the complexion of the *plexus choroides* verged towards that colour. The pineal gland, too, had an obscure tinge of yellow, and its structure was indurated, and contained a small body, which, however, was not sandy. Notwithstanding these circumstances, the remaining substance of the brain retained its natural appearance. In the *Sepulchretum* a case is noticed, in which, after protracted jaundice, the substance of the brain was exceedingly white, though not only the meninges were yellow, especially the *dura mater*, but the external surface of the cranium, and, in part, its inner surface also. It is well known that this disease occasionally tinges the bones, and some assure us that the stain cannot be washed out of the skeleton. An observation by Kerckringius, inserted in the same work, introduces to our notice the bones of an icteric fœtus exceedingly yellow; and this circumstance would not excite surprise, because, instead of blood, he found a yellow humour like bile. Vesalius observed the same alteration in the appearance of the blood in Martellus, a nobleman of Florence.

The urine is occasionally so impregnated with bile, as well as the blood, that both these fluids are nearly alike; and this has often happened when the disease did not prove fatal. The nasal vessels, too, have sometimes secreted a yellow serous fluid.—7.

Among those parts which are most easily and frequently tinged from yellow blood, are the adipose and conjunctive membranes. Valsalva supposed that fat contracted the saffron-like colour, from blood but slightly yellow, more readily than any other part, because he found this substance of a yellow colour in many bodies which had not indicated jaundice.

This yellowness is so manifest in the white of the eye, that the ancients persuaded themselves objects must appear yellow to persons afflicted with the jaundice; but it is probable, from the extreme minuteness of vessels distributed to the humours of the eye, and to the cornea, that they are not often imbued with bile.—8.

In some persons, however, these vessels may be more in number, or they may be dilated; and the bile itself may possess an unusually penetrating quality, as, in different bodies, it is found to have transuded through the coats of the gall-badder to the adjacent viscera in various degrees.—9.

Sometimes it is astonishing how large a quantity of bilious matter exists in the constitution, especially if various causes conspire to its production. Some of these causes are derived from the season of the year, diet, fever, immoderate exercise in the sun, and poison, even that which is inserted by the bite of a venomous animal. There is another method more familiarly known, by which the matter of the bile may accumulate in the blood, namely, when none is separated from it, either in consequence of some disorder of the blood itself, some affection of the secretory organ, or some obstruction of the hepatic duct or its branches, or of the ductus communis.—9.

This obstruction may arise from various causes. The ductus communis has been reduced to the narrowness of a capillary vessel—it has been converted

into a solid cord—its parietes have been indurated—they have become solid and bony—or been compressed by some of the circumjacent glands. But the more frequent causes are spasm of this duct; and the wrinkling which arises from this cause is propagated quite to the commencement of the small branches of the hepatic duct. Though an effect of this nature cannot fall under the notice of the senses, yet it is so consonant with reason that we are warranted to employ this hypothesis for the purpose of explaining those cases of jaundice which originate from violent affections of the mind, or from pain.

Among the more frequent causes are to be enumerated the obstructions which happen in other vessels as well as the biliary ducts; but it is my intention chiefly to consider the latter in this place, whether the obstacle arises from unusually gross and viscid particles secreted with the bile, or is owing to calculi engendered from them and from bile, and closing the hepatic duct or its branches, or the ductus communis.—10.

Biliary calculi.

It has been said that these concretions are often formed within the liver; but when I consider the almost innumerable dissections of the human liver performed by Valsalva and myself, I cannot assent to this opinion. Both of us have found many calculi in the kidneys, but I have only met with a calculus in the liver once; and, so far as I know, Valsalva never found one. However, the names of several eminent men may be adduced, to whom calculi situated in this organ have occurred, but only three of them have mentioned jaundice as the result. This immunity may easily be explained, for whether there are numerous small calculi, or concretions of conside-

rable magnitude, unless they are lodged in such a part as to obstruct or compress the larger branches of the hepatic duct, jaundice will not ensue.

Morgagni, xxxvii. 11.

Calculi appear to be occasionally formed in the acini of the liver; and this seems to have happened in the case of small calculi on the surface of this viscus, related by Riedlinus, though I believe that they are most frequently generated in the branches of the hepatic duct. In oxen and sheep nothing happened more frequently to Ruysch than to find calculi in the pori biliarii, and nothing more rarely than to meet with them in the parenchymatous substance. Although he attentively dissected away all the fleshy part of more than a hundred livers, in only one was there a calculus buried in the substance of the liver, and unconnected with the porus biliaris. I have never found them in any other part than in these branches; and sometimes they are so long and ramified as to resemble coral.—12.

An anatomical friend informed me, some years ago, that he had found a stone in the centre of the concave surface of the liver, the size and form of a pigeon's egg; and I believe it had been accompanied with jaundice. I do not wonder, however, that this affection was not observed in three women, although the liver contained either a much larger calculus, or a greater number of them, because, although within the membrane, they appeared rather exterior to the viscus than within its substance. In two of them the membrane was detached from the substance of the organ, and formed a sacculus for the calculi the extent of a hand's breadth: but in the third it is described as merely a pendulous follicle. George Greiselius has published a similar case, though the sac contained only one large concretion, with a considerable quantity of a glutinous humour. It occur-

red in a woman, and she had never complained of any thing except a sensation of heat in the liver.

Recollecting these examples, and observing that besides enlargement of the gall-bladder, another cyst, likewise distended with fluid, might hang from the liver, and resemble the natural cyst, I was rendered cautious when consulted respecting Laurence Bacchetti, formerly a physician at Padua. This gentleman had a tumour hanging below the liver, which could be immediately distinguished by applying the hand to the abdomen. It was of a globular figure, and so moveable that, by means of the hand, it might easily be conducted towards the right or left side. Various opinions were entertained by different physicians, but to me the tumour appeared to consist of the gall-bladder enlarged and elongated downwards by the excessive distention of fluid, and this opinion was fully confirmed on dissection. I had previously observed this circumstance, but particularly in an old man whose case is mentioned in the first letter of the *Epistolæ Anatomicæ*; and numerous examples are extant in ancient and modern writings. Martellus saw it the size of two fists; Zwingerus found it six times its natural size; and others have described enormous dilatations of this cyst. Van Swieten has cited an instance from the Transactions of the Society at Edinburgh. The patient was a boy not exceeding twelve years of age, but the gall-bladder contained eight pounds of bile. The same author reports a case which occurred to himself, in which the gall-bladder of a woman was so distended as to reach to the right os ilium, and its bulk was such as to occasion a protuberance between this bone and the lower ribs before the emaciated body was opened.—13.

Instances of calculi formed in the liver admit of no comparison, as to frequency, with those in which they originate in the gall-bladder; and

more than one reason may be assigned to account for the frequency of their generation in the cyst. Veslingius conjectured that the thickness of the cystic bile, and its detention in the receptacle, favoured concretion. Other authors have supposed it attributable to an augmented thickness of the bile in some persons, or to an unusual disposition to concretion, or a prolonged detention in the cyst in consequence of spasmodic wrinkles or contractions in the duct, or from a loss of contractile power in the coats of the cyst itself. When there is this relaxation in the parietes of the gall-bladder, the inability to contract increases in proportion as the bile retained becomes more redundant, as happens in the urinary bladder from retention of urine; and this appears the principal cause of the enormous dilatation which the gall-bladder sometimes undergoes.

To these causes of biliary calculi another was added by Abraham Vater. From the declivity of the fundus of the gall-bladder, and the obliquity of the duct, he supposed that only the more fluid part of the bile would escape, and that the remaining thicker part, unless speedily diluted by a fresh afflux of hepatic bile, would easily harden. If this fresh supply is deficient in quantity, or is secreted in a more viscid state than usual, it does not fully answer the purpose of dilution, and consequently the bile will be more liable to concreate.—14.

Under these varied circumstances we cannot wonder that cystic calculi have so often been found by anatomists of ancient and modern times. Whilst writing this article I have before me at least two hundred cases, nineteen of which occurred within my own practice. The cases to which I have adverted occurred to about an equal number of males and females, and only eight of them are said to have been young. The earliest age amongst these eight

was twelve years, and the most advanced, twenty-nine.

At the more flourishing period of life the juices are thinner, are moved onward with greater celerity, and less disposed to concretion, than at the decline of life ; and Haller ascribes the frequent occurrence of calculi in criminals who had long been imprisoned, to deficiency of muscular action. Although the meridian of life is its active season, yet the state of the juices is not to be compared with that attendant upon the vigorous prime of life ; and consequently it cannot equally resist the influence of intemperance and of passions of the mind.—15.

It has been affirmed that biliary calculi are of a paler or darker colour in proportion as the patient is young or advanced in years ; but certainly age is not so much to be considered as the matter of which they are constituted, for they do not always exhibit the colour of the bile in which they are found. Passing over cases of my own, I might observe that Vater found a calculus inclining to a white colour in a very thick and black bile : and, in bile of a bright yellow colour, Trew found a calculus which, through the greater part of its external surface, was whitish, and was brown in other parts. However, on slight friction it became exceedingly white, and internally, with the exception of a reddish spot, it was pale.—16.

A great number of those who have mentioned cystic calculi have been silent as to their colour ; but many have expressed themselves with sufficient clearness on this point ; and hence it may be asserted that they are generally found yellow or black, though they have also been met with of different colours. They have presented a blue appearance—they have exhibited small red points, perhaps from the adhering cyst being lacerated, as it was necessary

to disjoin them by force. They have been seen red—cineritious—whitish—and also of a golden and of a silver colour. But they exhibit a green or greenish colour more frequently than the others which have just been mentioned. I have often seen calculi presenting this appearance; sometimes I have seen the cineritious, and a few times those which were partially of a golden colour; but the others I have never witnessed.

Occasionally their colour has been variegated, as brown and white, white and a greenish yellow; and in the same cyst there were some which exhibited spots of a bright red or scarlet hue, and others pale. Scultetus found the cyst distended by a solitary calculus, which was pellucid like crystal. Tamponettius found them lucid and soft like gum, and the size of a pigeon's egg; and Manchius found them transparent, though friable; and as large as a filbert. Heister mentions a case in which the concretion, beneath a rugose surface, consisted of a transparent substance not much unlike gum, though somewhat harder than gum arabic.

A whitish calculus which occurred to Vaterus, was transparent; and thirty found by Scharpius were pellucid like a carbuncle. Eighty were found by Sanctorius resembling chrysolites—I suppose like the chrysolites described by Pliny as transparent and of a golden colour.

Regarding merely a shining property, we should notice other examples. Griselius met with a calculus but little less than a hen's egg, which, when broken into, glittered as if it had been full of nitre; and others have observed a resemblance to crystals of tartar or of talc. I do not find that the blue concretions of Neretius and Platerus were broken, but they shone externally; and Baglivi describes some which scintillated as if they had been a congeries of black crystals.—18.

It is necessary to adduce a few remarks relative to the magnitude, number, figure, and situation of these concretions.

They have been found of every intermediate size from that sufficiently large to distend the gall-bladder, down to the minuteness of a millet seed.

Vesalius mentions that the gall-bladder in Martellus was equal to the size of two fists, and was filled with concretions the size of millet seeds. With one calculus of considerable size, Fallopius found a hundred and twenty-three smaller ones. Bartoletus found three hundred; the brother of Platerus three hundred and six; Mentzelius upwards of seven hundred; Graseccius upwards of a thousand. In an ancient nobleman Storchius enumerated more than two thousand of these calculi: and Fascius, in the enlarged cyst of a man, found three thousand six hundred and forty-six granules of concremented bile. Although sometimes there is only a solitary calculus, it is much more common to find a greater number.

In their figure some are nearly spherical, and others are oval, but generally they are angular. The former receive their shape from the vesicle itself, for even those which are of considerable magnitude sometimes retain the softness of new cheese, and when this is the case, if a number of them occupy the cyst they will allow of being squeezed into that form. In the *Sepulchretum* an orbicular calculus is mentioned, which divided into nine triangular stones, and they were easily separable by the hand. A similar observation is extant, though, in this instance, the globular calculus, weighing two ounces and a half, separated into sixty lesser calculi, obscurely yellow and friable, each of them having five surfaces, and being exactly the weight of a scruple. Other examples are published of cystic

calculi, which, though resembling a pigeon's egg, were made up of lesser calculi, or compounded of granules.

It may arise as a question, whether calculi originate in these granules. They certainly are often found in the gall-bladder; and we might add to the examples already cited, a case from Du Verney, in which the gall-bladder contained small grumous concretions; and Albrechtus saw them like granulated sugar, or blanched milletseeds. In many cases, too, the calculi have a granulated surface, or are tuberculated like a mulberry, and appear to have been formed by granules deposited on the surface, and which afterwards unite into one body with the substance. It is, therefore, unquestionable, that calculi sometimes originate in these granules of concreted bile. In the cyst, with calculi, a great quantity of sandy and mucous matter has been observed; and if there should be an accretion of biliary matter to a particle of sand, as a nucleus, this will afford another source of calculi.

It has been stated that biliary calculi are generally angular. If many soft concretions are compacted into one oval or spherical body, so that by compression against one another they acquire new forms, and afterwards, from any cause, are separated, it is easy to comprehend the origin of their angles. Nevertheless, examples of this kind rarely occur, and we generally account for the angular shape from the friction of round calculi against each other. The smoothness of the surface of calculi indicates this friction; but two calculi delineated in the works of Hildanus clearly demonstrate it: for one of them was so excavated that it could receive within it nearly a third part of the other. A similar appearance is occasionally seen in urinary calculi from the same cause.—19.

By examining a large number of these calculi in my possession, I cannot discover any perfectly regular figure. Whenever the angles are very acute, or the surfaces of the calculi very rough, if a considerable weight is conjoined they may not only irritate the cyst but sometimes burst through it. An extraordinary instance of this rupture is published in the *Sepulchretum*. But the same irritation may produce inflammation, ulceration, and excrescences; and if we compare the gall-bladder with the urinary, we may suppose that the coats are liable to be thickened by this excitement. This thickening, indeed, has been observed; and Bezoldus describes a case in which the coats were indurated, thickened, and, in a measure, cartilaginous; but although the cyst contained calculi, he sought after a different cause of this morbid appearance; and certainly, under other circumstances, another cause may justly be assigned.

The surface of these concretions, however, is often smooth, especially if they are of a yellowish or greenish colour; for calculi of this description, even when dried, have a kind of unctuous smoothness, as if they had been smeared over with soap.--20.

When calculi are formed within the coats of the cyst, and are, at the same time, rough or large, irritation must be excited. In a case of dysentery related by Gendrotsius, I suppose the continual discharge of bile into the duodenum was occasioned by two pretty large and irregular calculi, involved in a peculiar membrane within the cyst. They had probably been generated within the glands of the cyst, and having enlarged, they extended between the coats where those glands are situated. In the first letter of the *Epistolæ Anatomicæ* I have mentioned that small biliary calculi were found by me in those glands, which opened by evident orifices;

and, in an observation very similar to mine, with the exception that the orifices were not apparent, Galeati noticed the same fact. Another case, in which a single small calculus was found within the coats of the gall-bladder, will be related in the sequel of this article. In a case related by Greiselius, an innumerable quantity of cubic stones occupied the gall-bladder, and the largest of them was enveloped in a membrane at the fundus of the cyst; and Ellerus found a small and round calculus, of a yellowish colour, surrounded with a membrane produced from pellicles of the cyst. These appearances, I have very little doubt, originated from concretions in the cystic glands. In no other situation could I suppose it probable that a calculus had formed which was apparently bilious, and the thicker part of which occupied a sacculus between the coats of the cyst, whilst the other closed its cervix. Indeed this cervix cannot be obstructed by a thick and hard body, without the compression of other parts which are necessary to the actions of the cyst; or the cyst itself might be contracted or writhed by the irritation, so that we cannot be surprised if the secretion of its glands is obstructed or impaired. The same may be said in reference to those experiments in which the meatus of this cyst has been tied in the living animal.—21.

In their structure, round cystic calculi, whether they are spherical, cylindrical, or oval, are constituted of concentric laminæ; but if angular calculi are divided into sections, the outer strata must necessarily deviate from the circular form, and the internal strata, likewise, as far as I have observed, will be nearly of the same kind. Therefore they are composed of successive strata, though they are not circular.

However, amongst the black calculi in my pos-

session, both spherical and angular, the greater part of them exhibit no strata. A few of the angular, indeed, that are the most firm in their texture, have an external stratum, though it is somewhat indistinct. Their structure, internally, is exceedingly black, and like coal.

It has been said of other calculi, that they are full of concentric strata, from the centre to the circumference; but numerous observations made by me on the nature of the nucleus in the *Adversaria*, in the first letter of the *Epistolæ Anatomicæ*, and in the letter to Schroeckius, show that I have found a considerable quantity of meditullium, in proportion to the bulk of the calculus. The greatest proportion was in calculi of the largest size, and I found this inner part occupied by soft and humid bile, and consequently so far from consisting of laminæ, it becomes a subject of inquiry how bile could penetrate through strata already firm.

The cuboidal calculi which I have cut into were not constituted of smaller concretions of the same figure, but like the others I have described, they consisted of bile invested with strata, which vary in their colour; and sometimes the variations are alternate. Nor does it unfrequently happen that the strata exhibit numerous lines proceeding towards the centre.—22.

Hoffman not only describes calculi with striated laminæ, but some having more evident lines proceeding from the centre in a continued course to the circumference. In calculi whose colour greatly resembled some described by me, Bæumlinus saw an appearance like saline spiculæ, running from the centre to the circumference, so that they appeared to be compacted of striæ rather than of lamellæ. Trew has delineated as well as described a calculus, in which there were obscure and confused radii, but

no lamellated structure. Maurice Reverhorst has delineated the sections of two calculi out of a large number taken from the gall-bladder of an old man. In one there was a shade of a circular shell, but in both of them there were strong lines like radii, proceeding from the centre to the periphery. John Baptist Contulus has represented stones found in the gall-bladder. One of them was diaphanous at its extremities; and he gives a section of another, in which there are many circular strata, but a much greater number of lines proceeding from the centre to the surface.

Malpighi has described a peculiar species of calculi, which greatly resembled soap, or rather camphor. They were constituted internally of elegant lamellæ, drawn from the periphery to the centre, and easily separable from each other. Morand described concretions which had shining and pellucid lamellæ; and Haller has distinguished others which shone like crystal, and were semi-transparent; and internally they were lucid, radiated, and lamellar.—23.

I shall subjoin a few remarks as to the means of ascertaining the existence of cystic calculi. It has been affirmed that jaundice necessarily results from calculi in the gall-bladder; yet out of nineteen cases in which I found them, and out of four which occurred to Valsalva, not one was associated with jaundice. Under other articles several cases have been introduced, and I shall add three.

CASE 1.

Cystic calculi, and central contraction of the stomach.

A poor aged woman had received a violent blow upon her head by a fall. She lived for many days, and her constant complaints were restricted to this

injury. At length she gradually sunk and died. There had been no appearance of the jaundice.

Dissection. The stomach appeared to be nearly double, in consequence of an abrupt contraction towards the pyloric extremity. The gall-bladder was half full of bile, which, being of a bright yellow colour, like orpiment, had imparted the same colour to all the neighbouring parts. Within the cyst there also were ten calculi of unequal sizes, but none of them very small. Other circumstances of this case, and some which relate to the following, have been detailed in the letter to Schroeckius.

Morgagni, xxxvii. 28.

CASE 2.

Cystic calculi, and morbid appearances in the uterus.

A woman nearly sixty years of age, died of thoracic inflammation. Her complexion had been healthy, though she was addicted to drinking. She had been married seven times.

Dissection. On the fundus of the uterus I found a scirrhus tubercle, the figure and magnitude of a small filbert. It was of a white colour, and was constituted of a multitude of smaller parts, which resembled contracted cells. Within the cavity of the uterus, a soft and almost gelatinous excrescence grew from the anterior and middle of the fundus. The ovaries were shrunk, as might have been expected at her age; but, contrary to expectation in reference to a woman who had been the wife of seven husbands, there were a great number of rugæ through half the length of the vagina, and the figure of the cervix uteri resembled the form of this part in the virgin, and the valves on one side remained. These circumstances led me to suppose that she had borne but few children, an opinion which deriv-

ed confirmation from the slenderness of the rugæ at the lower part of the abdominal parietes.

The gall-bladder was very short, nevertheless, with a small quantity of bile, it contained, at least, three hundred and thirty calculi—chiefly of a very small size; and one calculus I discovered between the coats of this viscus. In the blackness of its colour, and the smallness of its size, it resembled those I have already alluded to, as found in the glands of the cyst; but the orifice of the gland was not so evident.—*Morgagni*, xxxvii. 29.

CASE 3.

Cystic calculi, unnatural tortuosity of arteries, ossification of the inter-vertebral substance, tumour in the stomach, morbid production on the omentum, and diseased prostate gland.

A very old shoemaker died partly of old age, after labouring under catarrh for three days. The catarrhal affection was unattended with fever, but certainly the man had no jaundice, for his skin was exceedingly white. His body was brought into the college near the end of January 1744.

Dissection. The dura mater adhered very closely to the cranium, so that on the calvaria being removed, the external lamina of the membrane continued attached to the os frontis. The cerebrum and cerebellum were soft in their texture, and their medullary substance was rather brown. The three ventricles of the cerebrum were full of a pellucid fluid; the plexuses were pale, but the blood-vessels upon the surface of these cavities were turgid. The pineal gland was distended by a watery humour into the form and magnitude of a moderate-sized grape; but the pituitary gland was contracted. The arte-

ries at the base of the cerebrum, though empty, appeared to be unusually large.

The thorax contained a small redundancy of a turbid and brown fluid. The lungs were collapsed. The heart was enlarged, and the trunk of the aorta dilated. The tubercles in the semi-lunar valves of this vessel were ossified, and one side of one of them exhibited an osseous scale. White spots appeared through the whole course of the aorta, and even in the iliac arteries; and in two or three places a bony scale was observed between the fibrous and inner coats. Below the renal artery the aorta bent its course to the left side, and returned to the right before its bifurcation. The same unnatural appearance was observed in the iliacs, and from their numerous flexures they resembled the splenic artery. The carotid and vertebral arteries were not entirely free from this tortuosity. The anterior surface of all the intervertebral substances in the loins, except the lowest, projected like an air-bubble, especially on each side, where the prominence was nearly equal to the breadth of my little finger. All the prominences on the left side were bony; and on the right, the substance between the third and fourth vertebræ appeared as if it had been ossified, but this appearance was illusive. A bony lamina, that formed the surface of the body of the fourth vertebra, raised itself above the level of the vertebra, and extended upwards so as to cover that prominence with a bony crust, and beneath that incrustation the prominent ligament retained its natural texture. When I had transversely divided, with a chisel, one of the intervertebral substances on the left side, the usual concentric lines appeared; but every thing was of a pale and almost of a cineritious colour.

On the right side the omentum adhered not only to the colon but also to the small intestines and peri-

toneum. The stomach was straitened, and there were two protuberances in the pylorus. Near the cardiac orifice an encysted tumour was situated. This orifice was greatly enlarged, and, through an extent of four digits, the œsophagus was dilated, and unusually red; and the aperture in the diaphragm, through which this tube passes, was also much widened.

On the left side of that part of the omentum which adheres to the stomach, and not far from the fundus of that viscus, I observed a body like the spleen in its colour, coat, and texture, though, indeed, the latter was moister than the substance of the spleen. In its figure and magnitude it resembled the spleen of a middling-sized hen. The spleen itself was not wanting.

With a quantity of viscid bile the gall-bladder contained six or seven calculi. The largest was not less than a moderate-sized grape. It was nearly round, but its surface was uneven. All of them were extremely black, and resembled charcoal in their texture as well as in their colour; only they had some yellowish spots in them. When dried, most of them spontaneously fell into fragments. They sunk in water, and were not inflammable.

On the posterior surface of the urinary bladder, above the surface of the urethra, but projecting into the beginning of that canal, there appeared a white protuberance, somewhat larger than the seminal caruncle, which evidently was of the same substance as the prostate gland, and we therefore considered it an excrescence of this gland.—*Morgagni*, xxxvii. 30.

Many anatomists have reported cases in which the gall-bladder not only contained calculi without any symptoms of jaundice, but some persons are said to have had no evidence of any disease in conjunction with these calculi.—31.

In many of the numerous cases in which calculi of the gall-bladder and jaundice have existed at the same time, the latter has not been occasioned by the calculi, but arose from some disorganization of the liver, or obstruction of the *pori biliarii*.—32.

It must be admitted, however, that there are circumstances under which calculi of the gall-bladder may produce jaundice. It has been proved that the gall-bladder itself may be filled with calculi, or the cystic duct obstructed without jaundice ensuing, because bile passes into the intestine through the hepatic duct, and the *ductus communis*, and unless these canals are obstructed, bile cannot be retained in the liver on account of the biliary ducts. The obstruction in these ducts may arise from an excrescence or a contraction; or from a viscid and thick matter, or calculi, generated either in these ducts themselves, or being formed in the liver or gall-bladder, and descending into the ducts.—33.

I have no doubt that the ducts may also be obstructed not only by a thick and viscid matter but by bile itself, which may have become thick and tenacious. It must be observed, however, that a stone has been found to occupy the *ductus communis* without jaundice having supervened. Scultetus has related a case of this nature, in which that part of the duct which is inserted into the duodenum was obstructed by a calculus the size of a large pea, and not the smallest quantity of bile could pass. In so extraordinary an instance there might be some unusual construction of the biliary ducts. Fallopius asserts, that twice or three times he had seen the *ductus communis* divided into a double canal a little above the duodenum; and Vater found the extremity between the coats of the intestines divided, so that the duct opened by two distinct orifices. It is evident, if one orifice should be obstructed, a passage

for bile into the intestines yet remains open. There may exist, however, a still more uncommon duct by which bile may be transmitted from the liver into the intestines. Veslingius discovered one which proceeded direct from the liver into the jejunum—Bezoldus describes one nearly similar to this—and Diemerbroech has shown them produced separately from the ductus communis between the vesicle and intestines.—34.

I have already mentioned instances of constriction of the duct, but I might add another proof of this fact, taken from the body of a Venetian senator and historian, Andrew Mauroceni, and published by his physician Aurelio Palazzoli. He died of jaundice, and the cause was found to consist in an insuperable constriction of the ductus communis, in consequence of its having become callous. In the body of a person who had undergone protracted jaundice, Mead found the same duct, near its junction with the cystic, contracted as if a ligature had been applied, so that it would not admit a probe, nor could any bile pass through it. The contraction appeared to have been brought on by a scirrhus tumour of the pancreas. In the Transactions of the Cæsarean Academy the termination of the same canal was obliterated from a similar cause.

Examples of the more uncommon causes by which the tube is consolidated, or straitened by external compression, have been adduced; but the effects of the more frequent causes of constriction, namely spasmodic corrugations, are not so evident after death, as they are accordant with reason. We may probably consider the following observation of I. G. Maurerus as bearing upon this subject.

CASE 4.

An illustrious individual, after having received a slight wound in the region of the liver, was seized with bilious tertian fever and jaundice; and afterwards other diseases arose. Hopes of his recovery were entertained, and the jaundice had nearly disappeared, when he was exposed to considerable perturbation of mind. Inflammation of the fauces and lungs succeeded, and awakened anxieties respecting the probability of a fatal termination—an event which actually took place at the expiration of three days.

Dissection. There were three calculi of considerable size within the cyst, and the orifice and whole extent of the ductus choledochus was so much constricted as not to allow the smallest probe or bodkin to pass through, and much less any drops of bile.

At the time when the skin was yellow, and the feces were white, undoubtedly the cavity of this duct was contracted, but when the skin regained its natural colour, and the feces were plentifully discharged, and of a natural colour, the duct must have become more pervious. There may be no absurdity, therefore, in supposing that spasmodic constriction, which had been relaxed by tranquillity of mind and proper management, returned within the three days, accompanied with the train of mortal symptoms, in consequence of renewed mental distress.

Spasm is sometimes produced by irritation as well as by passions of mind. If the cyst is irritated from the magnitude, the weight, or figure of a calculus, and particularly if it is situated in the neck of the gall-bladder, a spasm may arise, with contraction and corrugation, and be propagated through the larger ducts, on the one hand to the liver, and on the other

to the intestine; and, undoubtedly, jaundice may be occasioned in this way. Therefore, as the jaundice may be brought on by a diversity of causes, even by mental influence, this disease will not afford any uniform criterion respecting cystic concretions.—35.

Indeed, I fear that there is no constant symptom of their existence which can be relied upon. Even when the bulk of the calculus is so considerable that it may be sensibly felt by the patient and the physician, yet this sign is ambiguous, because the gall-bladder may be surprisingly distended with thick bile, or sacculi may be loaded with calculi. The roughness of these concretions is not always such that they discover themselves by irritation. It very rarely occurs, that all the accumulated secretion is discharged from the gall-bladder, a circumstance which generally happens to the urinary bladder, so that nothing remains except the stone, by which the coats of the viscus are irritated. The gall-bladder, therefore, cannot closely embrace the stone, and if this were to happen, there does not appear to be the same degree of sensibility in the gall-bladder as in the urinary.—37.

When the ductus cysticus is obstructed by a calculus, pain is sometimes experienced about the ensiform cartilage, but this is by no means a frequent occurrence, and it often arises from other causes. The pain referred to has been ascribed to the ligamentum suspensorium. It is much more common, however, to find the pain extending into the umbilical region, in consequence of the jejunum being affected through its continuity with the duodenum.—42.

Sometimes biliary and urinary calculi are co-existent. I have met with some instances of this description, and have read others. Michael Mercati, who distinguished himself in the medical profession,

afforded an instance. Having been deeply afflicted with nephritic pains, he died. Two stones of a considerable size obstructed his ureters, and his kidneys were occupied by sixty-three calculi, most of which were rather small. He had never been affected with jaundice, but his gall-bladder contained thirty-six calculi of a dusky colour, of an angular shape, and the size of a vetch. When we read this and similar cases, we cannot but suspect that they are attributable to a common cause. If this is admitted, and a patient having indications of biliary calculi is found to be afflicted with urinary calculi also, some weight will be imparted to our suspicions, especially if the patient is middle-aged, or has attained an advanced period of life.

The age of the patient may assist us in distinguishing intestinal calculi from hepatic, when they have been discharged by stool. When a boy eighteen years of age had voided a concretion which weighed two ounces and a half, and supposed to be cystic, Carlius believed it to be intestinal, because a disposition to the formation of cystic calculi seldom exists at that age. Subsequent dissection corroborated this opinion.—43.

Although the symptoms of bilious concretions which have been stated must be viewed collectively, yet as they cannot all exist in every person, the signs most frequently observed must be regarded. For instance, when a stone descends into the ductus communis, there is pain in the right side, jaundice, vomiting, anxiety, relapse. However, we ought never to forget how easily deception may happen. Not unfrequently, indeed, the symptoms are rendered unequivocal, by some of the concretions, or by fragments of them being discharged with the feces. Therefore, when the signs of biliary calculi have

existed, the intestinal evacuations should be carefully washed, and passed through a sieve.*—44.

In reference to the treatment of this disease I have but little to say. When the patient is attacked by those violent pains which usually attend the passage of a calculus through the ducts, we must use our utmost endeavour to allay the irritation, not only with a view to mitigate the patient's suffering, but to obviate the danger of inflammation; and to promote the expulsion of the calculus, by relaxing the narrow passages. In proportion as the concretion irritates the ducts, they contract upon it; by which means the progress of the stone is retarded, and the pain increased. We must therefore supply the patient with diluents, demulcents, the mildest antispasmodics, and, if the pain should be intolerable, with opiates. Clysters, fomentations, and baths may also be employed, and, if there is plethora, venesections. There must be a careful avoidance of every thing of an irritating quality. Instances are related in which powerful emetics and purgatives are said to have dislodged calculi. Whilst I admit the truth of this statement, I would not purposely imitate such temerity, though it has been successful; because it is impossible to know that the

* Morgagni does not advert to that less frequent form of this disease which is usually denominated the black jaundice, but which Dr. Baillie calls the green jaundice. He says that it is more frequent in men than in women, less connected with intemperance than the other species, and not so often accompanied with ascites. The liver is often enlarged, hard, and tuberculated. In general there is but little pain, but often tenderness in the region of the liver. The progress is slow—the patients generally live a year or two, and very seldom recover. Dr. B. states that mercury has very little influence, but that moderate doses of neutral salts are the best medicine.—*Trans. Coll. Phys.* vol. v.—*Ed.*

ducts are adequately dilated, and that nothing is necessary, except the last impulse, to promote the escape of a calculus, into the intestine. Under other circumstances, the calculus may become entangled so that it cannot be dislodged—the pain may be rendered more excruciating—and the danger be increased. It has been affirmed, also, that even anger may disturb the progress of a calculus, and exasperate the pain.—49.

Even when the pain has ceased, in consequence of the calculus being expelled from the duct, I would abstain from purgatives, and only use mild aperients, lest the concretion, being arrested in its course through the bowels, should acquire such an increase of bulk as may prove injurious to the patient.—50.

The third object contemplated in the treatment, is to prevent the formation of fresh concretions. This will require the removal of whatever disorder may exist in the liver and in the blood, as well as of the circumstances by which that unhealthy state was produced. These affections may be brought on by a frequent use of unwholesome food and beverage, by impaired digestion, excessive sleep, and a sedentary life, especially if conjoined with much inflection of the body forwards. It may also be occasioned by violent passions of the mind.—51.

It has lately been proposed to perform lithotomy upon the gall-bladder. This operation would be destructive unless the cyst happened to be adherent to the peritoneum—a circumstance but seldom met with; and surgeons know how difficult it is to ascertain its existence.

Cases have occurred in which a tumour formed in the epigastrium, and on being opened spontaneously, or by art, cystic calculi were discharged at the aperture. In three examples of this lesion now before me, the first was cured. In the second, a fistu-

lous opening remained, by which a thin fluid, like chyle, but of a yellow colour, distilled. In the third, an ulcer continued, from which sanies was discharged, and, at times, bilious calculi.

Sometimes the cyst firmly adheres to the peritoneum, and then the case is more likely to end favourably if the cyst is opened by incision, than when left to itself so as for extensive suppuration to take place among the muscles lying before the cyst. The suggestion, however, is new, and therefore I thought it became me rather to wait till time shall have confirmed its advantages, than to be hasty in proposing the operation.*—52.

* I do not feel warranted materially to amplify the extended, and, in many respects, interesting account, which Morgagni has given of biliary concretions. He has shown their adversity as to external appearance, and as to the arrangement of the interior structure. Some appear to be distinctly laminated, and others very obscurely so. Some are radiated, as well as lamellated; and others consist of a uniform mass.

Dr. Baillie found that very few gall-stones yielded a bitter taste, and therefore infers that they do not consist of inspissated bile; but some were intensely bitter. Almost all melted in the flame of a candle; except those of a very black colour, which burnt exactly like a cinder. A gall-stone consisting of a chocolate-coloured substance exteriorly, and of white radiated lamellæ within, was found, by Dr. Saunders, to consist of a resinous matter, with a small proportion of earth, (apparently the calcareous,) and some mineral and volatile alkali.

In the Dict. des Sciences Medicales biliary calculi are divided into four classes. 1°. *Ceux qui offrent une couleur blanche, une structure lamelleuse, brillante, cristalline, et qui, sont entièrement formés d'adipocère.* 2°. *Ceux qui sont composés en partie d'adipocère et en outre d'une matière brune qui ne paraît être autre chose qu'il de la bile épaisse: ils sont polygones, et leur couleur est d'un brun grisâtre.* 3°. *Les calculs qui paraissent formés par la bile concrétée.* 4°. *Enfin les calculs non inflammables, mais qui se consomment peu à peu lorsqu'on les expose à une chaleur très vive.* The third species are usually found in beasts, especially in oxen, and very rarely in man.

SECTION VII.

ASCITES, DROPSY OF THE PERITONEUM, HYDATIDS,
AND TYMPANY.

In former parts of this work, especially when writing on the subject of hydrothorax, I have related cases in which serous effusion into the abdominal cavity had taken place. I shall, therefore, now

Brande divides biliary calculi into two kinds. He says—"those which most commonly occur are soft, fusible, of a crystalline texture, and inflammable; they have generally been considered as closely resembling spermaceti. They are soluble in boiling alcohol, in ether, and, difficultly, in oil of turpentine. Chevreul having remarked some peculiarities in this substance, is induced to regard it as a peculiar animal principle, and distinguishes it by the name of cholesterine. Cholesterine is fusible at 230° , and, on cooling, concretes into a crystalline mass. Rapidly heated to about 400° it evaporates in dense smoke. It is insoluble in water, and nearly so in cold alcohol. Boiling alcohol dissolves about $\frac{1}{20}$ its weight. It is soluble in nitric acid, but not convertible into soap by the alkalies. The other kind of biliary calculus resembles inspissated bile in appearance, but differs from it in being insoluble in alcohol and water: it is often mixed with variable proportions of the former, constituting biliary calculi of intermediate characters. The gall-stone of the ox is nearly insoluble in water and alcohol, and appears to consist chiefly of the yellow matter of bile; painters sometimes use it as a yellow pigment."

The coats of the gall-bladder are sometimes destroyed by large calculi, but in general, before this takes place, the attenuated part of the cyst becomes agglutinated with some of the adjacent viscera, or with the parietes of the abdomen. When it becomes adherent to the colon, the parietes both of the cyst and of the intestine sometimes ulcerate, and the calculus escapes into the latter. I believe the largest biliary calculus in the museum of the college of surgeons was removed from the umbilicus by Sir William Blizard.

The cystic duct has been ruptured by a calculus, and fatal consequences ensued.—*Ed.*

only adduce such instances from Valsalva's papers, and from mine, as have not yet been described.

CASE 1.

Ascites and anasarca.

Though anasarca was a more prominent affection in the man to whom this case refers, yet he laboured under ascites. The face was emaciated, and the remainder of the head was free from tumefaction, and therefore the limbs, especially the lower, when compared with the head, appeared to be of a monstrous size. He died in the hospital of Incurables at Bologna, in the year 1704.

Dissection. Mortification had commenced in the legs, and in some places the cuticle of the thighs was raised up into bladders, one of which was as large as my fist. Having cut down to the bone, I examined the sections, and found that the adipose membrane was greatly thickened, and that the greater part of its cellulæ Malpighianæ were filled with a serous deposition, which, in consequence of the numerous small membranes intervening between the cells, resembled jelly. As this cellular substance extends not only between the muscles, but also between the fasciculi of fibres which constitute the muscles, in all these parts serum had been effused, which presented the same gelatinous appearance. The scrotum was exceedingly tumid, in consequence of its cells, particularly those of the dartos, being distended with serum. A large quantity of fluid occupied the abdomen, but I did not open the cavity.—*Morgagni*, xxxviii. 26.

CASE 2.

Ascites, anasarca, and hydrops pericardii.

A man sixty years of age, afflicted with hernia,

was seized with a difficulty of breathing, accompanied with thirst. The abdomen and feet became tumid. In the progress of time his thirst abated, but he died.

Dissection. The adipose membrane and muscles of the abdomen, when cut into, were found to contain a serous deposition in their interstices, and a similar fluid occupied the abdominal cavity. A portion of the intestines was contained in a hernial sac at the lower part of the abdomen.

There was an abundance of fluid in the pericardium, and the blood in the ventricles of the heart was in a state of fluidity.—*Valsalva*, xxxviii. 2.

When the intestines prolapse and constitute a hernia, a lymphatic may be ruptured in the mesentery, in consequence of its being violently dragged downwards. This accident, however, can happen but seldom, and when it does occur, chyle as well as lymph issues from the vessel. Whatever might have been the cause of ascites in this individual, we observe that anasarca and hydrops pericardii were combined with it. The following cases will tend to corroborate the fact, that this form of dropsy is seldom uncomplicated.—*Morgagni*, 3.

CASE 3.

Ascites and hydrothorax attended with unusual symptoms—the omentum vesiculated.

Julia Bonetti, a slender woman, fifty-five years of age, and gibbous on both sides, was brought into the hospital on the twenty-ninth of November 1688. A few months before that time she began to complain of some difficulty of respiration; and at the time of admission, her breathing was laborious, and the difficulty was greater from decumbence on the left side than on the right. On sitting up in bed,

the dyspnœa became so urgent that she was almost suffocated. The measures resorted to were unavailing, the difficulty of breathing daily increased, her pulse became weak and languid, she had frequent swoonings, her face was tumid, and somewhat livid. She died about the thirteenth of December.

Dissection. The cavity of the abdomen was filled with a limpid fluid. The omentum was destitute of fat, but loaded with vesicles. The right cavity of the thorax contained about four ounces of fluid, and the left was replete, so that the liquid flowed out when the sternum was reflected. The lung, on this side, was somewhat tumid, and of a purplish colour; but the other deviated little from its natural appearance.—*Valsalva*, xxxviii. 4.

It is not easy to determine which of these dropsical affections had the precedence, though, from the lesion in the thorax it seems probable that the effusion commenced there. The increased difficulty of breathing from lying upon the side corresponding with the tumid lung, and also from sitting up in bed, are circumstances which do not usually arise from this morbid state of the chest.—*Morgagni*, 5.

CASE 4.

Ascites and hydrops pericardii, with anasarca; the serum in the abdomen coagulable.

In the autumnal season an old woman began to observe a degree of swelling throughout the body. Her respiration became difficult accompanied with thirst. The thirst subsided, but cough, with mucous expectoration, was added to the other circumstances; and decumbence on the left side was difficult. She generally lay upon the right side, and before death her pulse became exceedingly contracted.

Dissection. When the abdominal integuments were divided, serum flowed copiously from them. There was considerable tumefaction of the abdomen, and the cavity was distended with fluid. Some of this fluid being received into a glass vessel, its colour resembled that of urine; and after standing one or two days, it exhibited a concretion floating upon it, so firm that it was not broken by agitating the vessel. The remaining liquor being placed on the fire, speedily became turbid, and grew pretty thick, and soon afterwards slight concretion was evident at the sides of the vessel; but as evaporation proceeded, a pellicle formed on the surface. After having diminished one half, its consistence exactly resembled that of barley cream. The general structure of the liver was pale, but in some places it was diversified with whitish spots, which were larger externally than within its substance. The lymphatics were rather distinct about and below the lumbar regions, through the interior parts of the abdomen.

The left lung was unadherent, but the whole circumference of the right was united to the costal pleura; and when the membranes effecting this union were handled, a large quantity of serum, which occupied their interstices, issued from them. The sinuses of the heart, and the arteries, contained a large quantity of fluid blood, of a faint colour. The pericardium was exceedingly distended with serum, but although it resembled that of the abdomen in its colour, and in the firm concretion which was spontaneously produced, yet it did not coagulate when exposed to the fire; and on evaporation it left only a thin crust at the bottom of the vessel.

The saline particles of both these fluids were examined, but they were not observed to have any determinable figure, though they evidently differed

from each other. The concretion which floated in the serum of the pericardium had nearly a spherical form, and seemed as if it had been constituted of small vesicles collected into one body.

Valsalva, xxxviii. 6.

When Valsalva met with serous effusion into the abdominal cavities, it was customary with him not only to analyze the fluid, but also to investigate the state of the lymphatics, with a view to ascertain whether they were turgid, or were not discoverable. I presume he entertained some hopes, that, after an extended series of observations he might become able, during the life of the patient, to distinguish those cases in which the lymphatics are ruptured, by examining a portion of the effused fluid. Had he been successful in establishing this diagnosis, it would have had an influence upon the treatment; for, considering the case irremediable, his object could only be to prolong life, without any idea of curing the disease. Numerous observations would be requisite, because the qualities of lymph vary in different persons, and in the same person at different periods.—*Morgagni*, 7.

The appearance of the fluid at the time of dissection, is sometimes different from that which it presented in the living body, in consequence of the grosser parts having subsided, so that the upper part of the fluid is almost limpid. On the other hand, when it was exceedingly pure during life, it is occasionally rendered turbid or bloody by the dissection; and there are some hydropic fluids which have impurities united with them before dissection, in consequence of some visceral lesion.

A case is related in the dissertation of Schacherus, in which ascites was conjoined with an enlarged and diseased ovary. The fluid was rather limpid, but on evaporation it soon congealed into a fatty sub-

stance. It appeared to consist of only a fourth part of water, whilst the remaining three parts were sebaceous. I recollect to have heard Albertini say, that the water of some hydropic persons, being exposed to heat, evaporated only in a slight degree, the greater part coagulating; whilst in others the water had almost entirely passed off at the same temperature—a very small part only concreting.

We must be extremely cautious when the visceral disease is so slight that it may easily elude the notice of the dissector, lest, if any part of the deposited fluid should coagulate by heat, it may not be ascribed to its real origin.—8.

CASE 5.

Ascites, hydrops pericardii, and anasarca; the surface of the heart ulcerated, and the left auricle dilated.

In a man fifty years of age, who laboured under universal dropsy, the abdomen was full of water, though no tension was perceived externally. The liver was of a black colour, the spleen was somewhat enlarged, the remaining abdominal viscera were in a healthy condition. The lymphatics were exceedingly turgid, and below the renal vessels, near the vena cava, and round the aorta, numerous glands were visible through which these absorbents passed from the mesentery into the thoracic duct.

There was a redundance of serous fluid in the thorax, and the lungs were variegated with black spots. The pericardium was so much dilated with fluid that it resembled the inflated urinary bladder of an ox. The heart and all the vessels were proportionately large, and the left auricle almost equalled one half of the heart when of its natural size. The pleuritic coat of the heart was eroded on the left side, and the vessels had varicose contortions.

The ventricles contained fluid blood, without any coagulum.—*Valsalva*, xxxviii. 10.

As Valsalva found the pericardium so excessively distended, and the left auricle so much dilated, the motion of the blood must have been retarded, and probably the general hydropic affection resulted from this circumstance.—*Morgagni*, 11.

CASE 6.

Ascites, hydrothorax, and hydrops pericardii; the heart enlarged.

A woman, seventy years of age, breathed with difficulty, had great thirst, was teased with a dry cough, and could only lie in a supine position. After these symptoms had continued for a long period, the feet became œdematous, and she died.

Dissection. The abdomen was full of water. The lymphatics about the aorta, where it gives off the renal arteries, were turgid; but in the mesentery, and in other parts, they were scarcely perceptible. The kidneys were small and without hydatids. A moderate quantity of serous fluid existed in the thorax, but the lungs were healthy. The pericardium was full of fluid, and the heart double its natural size. The auricles were turgid with blood, which retained its natural fluidity and colour.

Valsalva, xxxviii. 12.

CASE 7.

Ascites and hydrothorax; adhesion between the heart and pericardium; lymphatics remarkably dilated; spleen tuberculated.

An old man, the same age as the subject of the preceding case, was afflicted with œdematous feet, violent thirst, and a cough, which, at times, was so

painful and violent that he appeared to be on the point of suffocation. He expectorated mucus, and breathed with difficulty. He could only lie upon his back. His pulse was low and feeble, and he died.

Dissection. Serum had been effused into the abdomen. The lymphatics about the division of the renal vessels were so extremely distended, that three or four of them were individually equal to the size of a goose-quill. The spleen was exceedingly enlarged, and exhibited some small bodies on its external surface like grains of millet seed.

Both lungs adhered to the sides, back, and sternum, having interstices, however, which contained fluid between them and the costal pleura. There was no moisture in the pericardium, and this capsule began to adhere to the heart by numerous membranous filaments. The blood in the heart was coagulated.—*Valsalva*, xxxviii. 13.

Although both these patients required a supine position, yet the pericardium was not distended with serum in each of them. In both, the visceral disease was considerable, but it was not of the same character, and the blood was in a different state. The causes, therefore, of choosing the same posture on lying down are variable, and I have already shown that sometimes they are not easy to be explained. This observation will be corroborated by comparing the two following cases with each other, and with the preceding case.—*Morgagni*, 14.

CASE 8.

Ascites and hydrothorax.

A slender woman, about twenty-eight years of age, received a wound at the umbilicus, and four months afterwards she breathed with difficulty,

was very thirsty, had slight expectoration, and complained of pain in the left side of the thorax. She was unable to lie upon that side, or on the back. The urgency of all these symptoms increased, and the disease proved fatal.

Dissection. Not the least trace of lesion could be detected in the abdominal viscera, except that the intestines corresponding with the navel had a blackish colour. However, the cavity of the abdomen contained four pints of a yellowish serous fluid; and the left cavity of the thorax was full of water similar to that found in the abdomen, with the additional circumstance that concretions floated in it. The lungs were healthy, and free from adhesions. The whole of the right lung adhered closely to the costal pleura, and was somewhat indurated, as if it had been inflamed. The lymphatics were not turgid.

Valsalva, xxxviii. 15.

CASE 9.

Ascites and hydrothorax.

A young man about seventeen years of age, was seized with a difficulty of respiration, as well as with dry cough, and urgent thirst; and he voided but little urine. He experienced slight pain in the right side, and lay constantly upon it. At length he died.

Dissection. The abdomen was full of water, the liver was indurated, and the intestines and stomach were rather pale. The spleen was somewhat enlarged, and the lymphatics were free from that turgidity which sometimes takes place in dropsical persons when the viscera are healthy.

The right cavity of the thorax overflowed with fluid, and the lung contained in it was indurated and adherent to the diaphragm and mediastinum. There

was little or no serum in the pericardium, and the blood in all the vessels was fluid.

Valsalva, xxxviii. 16.

The reason why this patient lay upon the right side was the quantity of fluid accumulated in the thorax on that side; but how did it occur that the woman, who had water in the left cavity, was unable to lie on the corresponding side? Undoubtedly we must ascribe this contrariety to the different states of the lungs.—*Morgagni*, 17.

CASE 10.

Ascites and hydrothorax.

A young man, about twenty-eight years of age, greatly addicted to excess in eating and drinking, was afflicted with a difficulty of respiration; and after the lapse of some years, he became the subject of general dropsy. About seven days before his death, the dyspnœa became urgent, and was accompanied with cough, expectoration, and pain in the chest.

Dissection. The abdomen and thorax were full of a brownish serum, and all the viscera, except the intestines and stomach, were tinged of the same colour. The stomach was excessively dilated; the spleen was enlarged to three times its usual magnitude; the bile was of a pale colour; and no lymphatics were observable.

The left lung was highly inflamed, and adhered to the costal pleura by membranes, in the interstices of which, the serum I have mentioned was confined.

Valsalva, xxxviii. 18.

It was hypothesis, rather than the authority of Hippocrates, or the dissection of dropsical bodies, which formerly induced the generality of physicians to believe that dropsy was most frequently occasion-

ed by disease in the liver; and next in frequency, by lesions of the spleen. Certainly, whatever circumstance, either in the viscera or elsewhere, may retard the motion of the blood, or of the lymph, for a considerable time—whatever occasions an excessive secretion of the moisture which pervades the cavities of the body—whatever prevents or diminishes its absorption—may give origin to this disease.

But in the abdomen, besides the lesions of those viscera which have been named, there are peculiar causes by which fluid may accumulate in its cavity. Piccolhominus relates the case of a man who had been drinking immoderately, but voided no urine, and on a catheter being introduced it was discovered that none was retained in the bladder. His abdomen became tumid to an astonishing degree, and, in process of time, the man died. By examination after death his kidneys were found lacerated with calculi, and urine had flowed out of these organs into the abdominal cavity. In the *Sepulchretum* cases of ascites are related by Platerus and Dodonæus, in which the liver and spleen were healthy, but the urine had flowed out of the kidney or the bladder, in consequence of its being perforated by ulceration. Vater and Winhart have reported, that in two men urine was effused into the abdomen in consequence of rupture of the ureters. In a boy six years of age, whose urine could not escape from the kidneys through the natural channel, the kidneys had become exceedingly distended, and, at length, the secreted fluid perforated their surfaces, and distilled into the abdominal cavity.

To causes of this description those cases also belong, in which the coats of the stomach are so perforated as to afford an exit to fluids rather than solids, and, in that way, ascites may be produced; or, if effusion had previously taken place, the accumulation will be increased.

To the examples of dropsical affection unaccompanied with hepatic and splenic lesion, which are extant in the Sepulchretum, many others might be added. Some are supplied by the Cæsarean Academy, and the symptoms in one of them were calculated to excite a very confident belief that the liver must be considerably diseased. Of nothing did the patient more complain than of pain which appeared to be seated in that viscus. Nevertheless, after death no trace of disorganization was discoverable in the liver, or in the gall-bladder, but the adjacent part of the mesentery was the seat of an ulcer equal in extent to the palm of the hand.

We must not, however, follow the example of those who have run to the opposite extreme, and assert that diseases in the liver and spleen rarely, if ever, occasion dropsy. Organic lesion in one of these viscera, especially the liver, is often found in dropsical cases, and not unfrequently, disease exists in both of them.

I have no doubt that ascites has commenced independently of disease in any of the abdominal viscera; but the dropsical affection has been the cause of disease by its long continuance. Frequently, however, the severity of symptoms, and the examination after death, afford evidences that visceral lesion had preceded serous effusion. The following cases tend to demonstrate the accuracy of this statement.

Morgagni, 19.

CASE 11.

Ascites from diseased liver ; large calculus in the gall-bladder.

A woman had laboured under ascites.

Dissection. None of the cavities of the body were full of serum except the abdomen. The liver was

indurated, and the gall-bladder contained a stone which occupied the whole of its cavity. The lymphatics were not visible, nor were the intestines inflated.—*Valsalva*, xxxviii. 20.

In addition to other cases brought forward, this instance shows that jaundice does not always accompany cystic calculi. The magnitude of the calculus indicates that it had been long in its formation, and consequently that the liver, in which bile suitable to its generation had been secreted, could not have been exempt from disease.—*Morgagni*, 21.

CASE 12.

Ascites from a diseased liver and pancreas ; diseased uterus.

An old woman died of ascites in the hospital at Padua, about the end of 1716.

Dissection. The quantity of fluid effused was not very great. The liver was beset, externally and throughout its texture, with numerous white tumours, which were not very hard. In the pancreas there was a similar tumour, harder in its texture and much larger, as it occupied all that part of the viscus which is connected to the intestinum duodenum. The proper coat of one of the kidneys was greatly thickened, and could easily be drawn off by the hand. The tubuli, also, of this organ, were much more evident than usual. The uterus exhibited a cicatrix externally, but there was no mark of disease within it, nor any relic of a wound in the abdominal parietes. On the opposite side, not far from the cervix, a roundish tumour protuberated. In colour it was red, inclining to lividness, but it was not harder than the substance of the uterus. In the ovaries there were some thick, white vesicles, all of which were empty except one which was larger than the rest, and contained an aqueous humour.

A small redundance of serous fluid existed in the thorax, but the brain was in a perfectly healthy state.—*Morgagni*, xxxviii. 28.

There was sufficient cause in the pancreas and liver to counteract the formation of healthy chyle and blood; and also to retard the current of blood and lymph through the abdomen.

Disease in the liver of sheep, which often occasions effusion into the abdomen, butchers distinguish by the pallid appearance of the tunica adnata, and of the caruncle of the eye. The deficiency of red blood is more clearly evinced in these parts than in others.—29.

CASE 13.

Ascites from diseased liver and spleen; hydrocephalus; suppurated kidney.

Caspar Lombria, a robust Venetian nobleman, and of a bilious temperament, after having passed his fortieth year, was seized with a disease which assumed a diversity of forms; and though, after a long period, he recovered from it, his abdomen continued to be unusually tumid for some time, and when it subsided, occasional diarrhœa supervened. The urine became deficient in quantity, and was of a high colour. About the end of winter, 1722, being then forty-seven years of age, his strength began to fail. For a month he had constant diarrhœa, discharging matter of various colours, but generally crude, serous, and frothy. Before this time the purging had not affected him for more than eight or ten days in succession, within which he discharged a copious quantity of yellow and fluid matter. Although the remedies employed removed the diarrhœa, it returned soon afterwards with augmented profuseness, in consequence of inattention

to his diet; but it was again restrained. From infancy he had been the subject of tremour, which, after his first illness, became more evident throughout the body, and from the intestinal fluxes it was occasionally increased in violence, and began to be accompanied with some new affections of the head. Wine was ordered to be discontinued, and some blood was abstracted, upon the surface of which a crust formed, one half of which appeared of a green colour. Within a month he was greatly relieved from those affections, but being weary of the medical regimen, (though it had been so beneficial to him,) on the thirtieth day he relinquished it, and exposed himself to violent perturbation of mind, and to great bodily exertion. Within fifteen days he was seized with that disease which ultimately proved fatal. His abdomen, which previously was often distended with flatus, began to be constantly tumid, tense, and uneasy; and, on percussion, it sounded like a drum. His feet were slightly œdematous; his urine was of a very high colour, and deficient in quantity; and his thirst was troublesome.

About the end of May my advice was solicited, but supposing that some organic disease existed, I despaired of curing the patient; especially as he had scarcely been without disease for seven years, and had become the subject of his present disorder when reduced by another. Although the abdomen daily became more tumid, it did not resound when struck with the hand, so that he did not appear to have tympany, but a rapidly increasing ascites, to which hydrothorax, and, finally, hydrocephalus, were added. When a hand was laid upon one side of the abdomen, whilst the opposite side was struck with the other hand, fluctuation could be perceived. At the expiration of a few days the belly was not merely full of water, but immoderately distended,

and resisted the hand. His feet, legs, and thighs became exceedingly tumid, whilst the face and upper limbs were emaciated. He could now only lie upon the right side, and twice a sense of suffocation compelled him to leap out of bed. During the last ten days he was affected with a degree of coma and very slight delirium. The action of the heart, previously very powerful, sometimes became extremely feeble; but the strength of the other muscles scarcely failed to the last. He had pain in several parts of the abdomen, and experienced a sensation of pricking in the region of the liver. Every means likely to increase the quantity of urine was resorted to, but in vain, as generally happens when the efforts of nature do not co-operate with the physician. Towards the close of life, the urine twice threw down a deposit the colour of tobacco, which I found was blood mixed with pus, and this discovery led me to recommend the discontinuance of diuretics. Whenever medicines acted on the bowels, and especially when they occasioned watery discharges, a troublesome sensation in the region of the stomach was alleviated for some hours. No measures, however, afforded any permanent relief, and he died like a suffocated person with his face and shoulders very livid; and water and blood issued from the mouth and nostrils after death. The following day, August the third, the body was opened for the purpose of being embalmed.

Dissection. The upper limbs were marked with petechiæ, and the whole of the back, as well as the lower limbs, were œdematous. The parietes of the abdomen was distended to the utmost degree, by fetid serum, of a yellowish green colour; and flakes of lymph floated in it. The stomach, intestines, and mesentery were black. The liver was hard internally, and its surface was tuberculated. The spleen

was large, and of a compact texture; and when cut into, no blood escaped from it. The pelvis of one of the kidneys contained pus.

In the thorax, especially on the right side, there was a large quantity of serous fluid similar to that which occupied the abdomen; and the pericardium also contained a small quantity. The lungs were turgid and blackish.

We were not permitted to open the head.

Morgagni, xxxviii. 30.

Numerous cases are recorded in which dropsy was accompanied with a tuberculated state of the liver; and whenever this lesion occurs, it must be injurious to the functions of that viscus, and will retard the circulation of the blood through the abdomen. It is not of such a nature as to admit of cure by medicine, and when there are symptoms of organic lesion we must not heedlessly prescribe the evacuation of the fluid. On this account no one of the numerous physicians who attended the noble patient, whose case has just been detailed, ever recommended it. If the fluid is drawn off under these circumstances, it will again accumulate; and many instances have occurred in which inflammation and gangrene of the peritoneum, and of the intestines, have resulted from paracentesis. Scherbius has described the case of a man in whom ascites was produced by a calculus which formed in the recepticulum chyli. The fluid was drawn off seven times, but the patient died sixteen hours after the last operation. Although this operation must not be performed without due consideration, it has sometimes been successful, but the instances are very rare.—31.

Albertini informed me that he had never cured ascites when it was confirmed. For, said he, if the water is evacuated by the surgeon, the patient dies;

and if a powerful attempt is made to urge it to the kidneys or to the intestines, the medicines which excite those excretions, do not so much discharge the fluid which had been effused into the abdomen, as the serum remaining in the blood, and they do not direct it more into these passages than into the abdomen. He told me that a man of eminence had recently taken remedies of this nature from an empiric, and the quantity of urine certainly was augmented, but the swelling of the abdomen was greatly increased at the same time, and scarcely any blood was found in the blood-vessels after death.

Some of the reputed cases of ascites were probably cases of recovery from anasarca, or from dropsy of the peritoneum. Others might have been performed by the efforts of nature, which in this, and in other diseases, are sometimes very considerable.

A noble youth, in my native place, was twice seized with ardent fever, and drank an excessive quantity of water. Each attack was succeeded with considerable effusion into the abdomen, but both times the fluid was carried off by the spontaneous discharge of a large quantity of water. Nature had unlocked the passages by which the fluid might be absorbed, and it was directed into another part of the body. Mead speaks of a merchant in whose abdomen so much fluid was contained that it was determined to draw it off; but in the night before the appointed time for the operation, the whole was absorbed, and was retained in the vessels. But when the efforts of nature are not put forth, and gentle excitants are unavailing, we must not resort to violent and dangerous expedients, but rather employ paracentesis, if all the circumstances admit of it.*—32.

* The spontaneous removal of dropsical effusions has been

This operation, it is probable, was first suggested by the navel having burst from distention, and the ascites being cured by the consequent discharge. For some time it was recommended to draw off the fluid by degrees, and at different times; but when the method of compressing the abdomen with rollers, not only after, but during the evacuation, was devised, the fluid was drawn off at once with impunity. This measure was contrived by Dr. Mead, and was first practised by him; and the quantity of fluid which has been discharged by repeated operations on the same individual, is almost incredible. Mead had related the instance of a woman from whom a thousand, nine hundred, and twenty pints were taken in seven years and a half. The puncture is not made at the umbilicus because the wound does not heal there so well as at other parts.—33.

CASE 14.

Ascites from hydatids, with diseased liver and uterus; superfluous spleen; hydatids and tubercles on the spleen, the peritoneum, and intestines; hydrops pericardii.

A maiden twenty-two years of age, who had not known to occur in other cases. They are most remarkable, however, when the absorption has taken place under the dread of an expected operation. This has not only occurred in ascites, as referred to by Mead, but also in hydrocele. It is not, however, limited to those instances in which the patient's mind had been agitated by painful forebodings, but occasionally the same phenomenon has been witnessed without any apparent cause, though usually accompanied with redundant evacuation from the bladder, intestines, or skin. In the *Medico-Chirurgical Journal*, Mr. Colville has related an interesting case of the spontaneous removal of ascites. The man, forty years of age, had been tapped eighteen times, and by each operation from fourteen to eighteen quarts of fluid were removed; but, at length, after profuse perspiration of three days duration, he perfectly recovered.—*Ed.*

menstruated for two years, was attacked with pains in the hypochondria, and afterwards the abdomen became tumid. At the expiration of a year after the commencement of this abdominal tumefaction, she was admitted into the hospital at Padua. The belly was exceedingly large, yet she could assume the decumbent posture, but lay chiefly on her left side; she was rather thirsty, and feverish, and voided urine scantily, but it was not high coloured. She occasionally complained of the pain in the hypochondriac regions, but it was not violent. None of the remedies employed ever augmented the quantity of urine. In process of time, the bowels, from a state of constipation, became relaxed; and liquid offensive stools were discharged. The fulness of the abdomen did not lessen, but her strength decreased and she died about the middle of December 1744.

Dissection. The body was emaciated, particularly the upper limbs, though not to a great degree; and the lower limbs were very slightly œdematous. The abdomen was extremely large but not tense, even at the navel, which protuberated. Having perforated the abdomen on one side, a large quantity of serous fluid was gradually discharged, which left the same sensation upon the hands as a lixivium would have occasioned. That which first issued was yellowish and thin; the remainder was thicker and almost white. When both these portions were examined at the expiration of twenty-four hours, the whole of them appeared whitish, and they contained some little pieces of omentum and other things which will be spoken of hereafter. In three places, the small intestines, to the extent of a digit, began to assume a black appearance; nevertheless neither the fluid nor the body exhaled an offensive odour. The greater part of the small intestines was distended with flatus, but the large intestines and the sto-

mach were empty and collapsed. With the exception of a small part attached to the stomach, the whole omentum was torn in pieces; and one of these portions had formed itself into a round and soft body, of a red colour, and nearly the length of a man's forearm.

The whole of the convex surface of the liver, and even its anterior border, were attached to the diaphragm; and when disjoined from that septum, its surface appeared more prominent than usual. Throughout, this viscus was somewhat pallid and indurated; the cystic bile was small in quantity, of a brownish yellow colour, turbid and viscid. The spleen was enlarged, but its texture was healthy, and there was a second spleen connected with the former by membranous productions, although quite distinct in its substance. In the coats of the larger spleen there were hydatids, and roundish tubercles, of different sizes, but most of them somewhat larger than millet seeds. The same appearances were observed in some places on the inner surface of the peritoneum, and the exterior surface of the intestines. The largest of the hydatids attached to the intestines was equal to the size of a small apple, and two digits in diameter, the blood-vessels from the intestines extending into its membranes, and ramifying through them. It contained almost colourless water, though partially mucous. The pancreas was somewhat hard, and the mesenteric glands were enlarged and perfectly scirrhus.

The principal disease, however, was seated in the ovaries, Fallopian tubes, and the uterus. The ovaria and tubes had coalesced with the ligamentum lata, and being much thickened, they formed tuberoses and shapeless but inodorous masses, of a considerable size, and without any distinction of parts. The surface of each mass was extensively lacerated,

and was found spontaneously open, just as if a large steatomatous tumour had burst. With this I compared it, because it consisted of matter which bore a greater resemblance to half dried suet, than to any thing else. It felt of an unctuous nature, and readily yielded to the probe; and when pulled asunder, it evidently appeared to consist of numerous small pieces. On cutting into the uterus, I perceived that not only its outer surface was healthy, but the greater part of its parietes. The remaining internal portion of these parietes, however, was converted into a substance resembling that which has just been described, except that it inclined to a cineritious colour. The fundus was filled with this morbid production, some of the softer part of which smeared the vagina, and we supposed that this discharge had usually existed. The internal orifice of the uterus was somewhat dilated, but the uterus itself was not enlarged, nor was the cervix diseased.

The trunk of the aorta appeared smaller than usual; and the diaphragm ascended pretty high into the thorax, especially on the right side. The lungs adhered closely to the parietes of the thorax, and the upper part of the left lung was somewhat indurated. A large quantity of water, similar to that in the belly, occupied the pericardium; and the heart was flaccid.

When the head was detached from the neck, a little serous fluid issued from the cranium, and from the vertebral canal; and a considerable quantity of a brownish and turbid fluid was found in the ventricles.*—*Morgagni*, xxxviii. 34.

* I shall adduce only one example from my own dissections which bears upon the present subject. The patient was afflicted with ascites and hydrothorax, in consequence of extensive lesion in the ovaria, peritoneum, omentum, and liver. As the ovarian tumours were distinctly fungous, and many of the tu-

On the hydatid origin of dropsy and tubercles.

The state of the uterus in the preceding case will be referred to more properly on a future

bercles in the omentum and on the peritoneum presented that appearance, I am led to think, from the general analogy of circumstances, that the tumours of the uterus and its appendages in the above case, were of the same character. The instance which I am about to relate will also be a suitable precursor to Morgagni's observation on the hydatid origin of tubercles.

On the 21st of February 1821 I was requested to see Mrs. C. who resided a few miles from London. She was about forty-five years of age, and had been ill for some months. Her countenance was sallow, and she had pain and tenderness in the right hypochondrium, and a flushed face. The pulse was a hundred and ten, and small; the bowels were constipated; and the left leg was swollen, inflamed, and painful. I had no doubt she was the subject of organic disease, and could cherish but little expectation of rendering any essential service; yet, contrary to expectation, by the middle of April she appeared so nearly well that I ceased attendance. However, on the 24th of this month pain came on again in the region of the liver, and extended to the right scapula and shoulder, accompanied with febrile symptoms. For a time she appeared again convalescent, but notwithstanding the delusive amendment she had experienced, the ravages of disorganization had been insidiously going on, and though the progress seemed to be occasionally retarded, yet, from this period, by successive accessions of disease, the fatal termination approached. About the middle of May the abdomen became exceedingly tense and tender, respiration was very difficult, and she voided but little water; and by the end of the month her distress was so urgent that, on the thirty-first, I performed paracentesis, and drew off about two gallons of fluid. The fluid was exceedingly bloody; indeed that drawn off last was almost like pure blood; and had I not introduced the trochar at the linea alba I should have feared that some important vessel had been wounded. For about thirty hours respiration was considerably relieved, and on carefully examining the abdomen when the integuments were flaccid, I found there was a tumour in the hypogastric region. By the fifth of June her respiration was again exceedingly difficult, and she complained of pain in the right side between the spine of the ileum and the ribs, and also below the convexity of the ribs on the opposite side; and both

occasion. The accumulation of fluid seems to have arisen from ruptured hydatids, for whilst some hydatids were still prominent on the external surface of the intestines and spleen, I apprehend that an incalculable number had burst long before, and poured their fluid into the cavity of the abdomen.

these parts were very tender. She had a considerable degree of hectic fever; and, though able to lie down, she preferred reclining upon her elbow. She never underwent any attack of orthopnœa; she had no cough, and the pulse was perfectly regular; yet I had no doubt effusion had taken place into the thorax. The fluid was evidently accumulating again in the abdomen, and her legs became anasarcaous. During the four days immediately preceding death, which took place on the seventh, her urine passed off involuntarily, and she had violent pain in the region of the bladder.

Dissection. The face was florid and the legs œdematous. Within the abdomen there were about four quarts of serous fluid, the lower part of which was exceedingly bloody. The abdominal viscera presented striking morbid appearances, and the first part which came into view was the omentum, extending across the abdomen in a solid mass, about an inch and a half or two inches broad. In the left hypochondrium it adhered to the peritoneum by a small extremity, and, on the opposite side, it was united to the same membrane by a more extended and scirrhus substance. The omentum was universally tuberculated, and in some parts there were vesicles containing a serous fluid. The peritoneum lining the abdominal parietes and the diaphragm, was universally tuberculated, and in the iliac region it was nearly of a livid hue. The peritoneal coat of the stomach also was tuberculated, and that of the intestines was partially so. The vessels of the intestines were turgid, and the transverse arch and descending portion of the colon adhered to the peritoneum. The liver was much enlarged, but the increase was in thickness rather than by elongation; and it had contracted some morbid adhesions with the diaphragm. The convex surface of the liver presented a whitish appearance, but when cut into, its texture appeared more spongy than usual, and was saturated with blood. The gall-bladder contained bile. The vessels of the mucous coat of the stomach, as well as of the exterior, were turgid with blood, and the right kidney exhibited unusual vascularity.

The observations which I have frequently made upon the tunica albuginea, and tunica vaginalis testis, induce me to believe that the membranous la-

In the hypogastric region there was a mass of disease which, on careful examination, I found to consist of a distinctly fungous tumour of each ovarium. That of the left ovary was the largest, and had some vesicles upon it; but there were most vesicles on the right. The white fungous production had burst through the capsule which appeared originally to have contained it, and was shooting up irregularly. The cavity of the uterus was nearly obliterated, as not unfrequently happens at this period of life.

As soon as the cartilages of the ribs, on the left side, were divided, serum began to issue. The cavity was completely full of serum, which, at the top was yellow, but, at the bottom, was deeply coloured with blood. The lung was compressed into so small a space, that I could hold it within my hand: it was the most remarkable instance of condensation of lung which I had ever seen. Its texture was flaccid. I removed from this cavity between five and six pints of fluid, and the other cavity contained between four and five pints. The lung on this side was proportionately contracted. The heart was very small, and had been displaced so as to lie immediately below the sternum; and the pericardium contained about an ounce of serum. In the right lung there was a portion of calcareous matter the size of a horsebean. Some parts of the pleura were nearly black from congestion of blood; and blood had evidently escaped from the minute vessels in those places.

Ascites sometimes arises from inflammation of the peritoneum, and this membrane lining the abdominal parietes has been found, in such cases, a quarter of an inch or more in thickness, and that of the intestines inflamed, and dotted or covered with lymph. But there is another morbid appearance on this membrane which probably arises from the effused fluid, and is not the *cause* of effusion. Red points extended over the peritoneum, and arising from inflammation of the dotted petechial character, Mr. Travers, in his work on Injuries of the Intestines, says, are peculiar to the effusion of an irritating fluid.

The most extraordinary case of ascites which occurs to my recollection at the present moment, is related by Dr. Bezard. The patient, a woman, had been afflicted with the disease for thirteen years. The quantity of solids and liquids she took was never equal to that of the fluid removed. She underwent the

minæ of hydatids, or of the coats in which they are formed, after having been so ruptured as to occasion an effusion of their contents, first contract themselves and their vessels into the form of a caruncle, and unless more fluid continues to issue from them, they become so indurated as to constitute tubercles. In the case related, the tubercles were white and hard, of a roundish figure, and of various sizes, as the hydatids had been; and they beset the inner surface of the peritoneum, and the peritoneal coat of the spleen and intestines.

In the Sepulchretum it is related that in the body of a woman who laboured under ascites, Jacobus

operation of paracentesis 665 times. Twenty times it passed off by the urinary or the digestive organs, and the total quantity was 10,275 pints, or about thirty-five Burgundy hogsheads.

Dissection. The intestines were inflamed and agglutinated; the peritoneum was thickened to the extent of three lines, and cartilaginous; exhibiting an appearance like rind of bacon. The intestines were contracted, and the stomach small and inflamed. There was no appearance of omentum, mesentery, kidneys, liver, gall-bladder, pancreas, spleen, or urinary bladder, and their situations were unoccupied; but in the right hypochondrium there was a scirrhus tumour, in the form of the liver, and constituted of the union of all these viscera. The uterus alone retained its natural form and colour. The thoracic organs displayed nothing except diminution of volume; and the intellectual faculties were unimpaired.—*Med. Chir. Journal*, Sept. 1817.

The omentum has sometimes been found excessively thickened by large cysts containing a pellucid serum, a gelatinous substance, or a substance like honey, like suet, or paint. Sometimes it is the seat of prodigious adipose tumours, of dropsy; which generally is complicated with ascites; and it has been found inflated when it did not seem ascribable to putrefaction. In ascites it is not very uncommon to find it horny. It is sometimes the seat of abscess, and being liable to contract adhesions with the adjacent parts, as has been demonstrated by many preceding cases, the contents of abscesses and cysts of the omentum have sometimes been emptied into the colon in consequence of ulceration.—*Ed.*

Wolffius saw caruncles attached to the intestines in several places, and, when opened, they discharged ichor. Bilgerus speaks of another ascitic woman whose intestines, and also the peritoneum investing the diaphragm, were covered with many thousand little granules, resembling the appearance occasionally seen in hogs. In the body of a young man, Anhornius saw the peritoneum beset with nodules; and on the same membrane of a woman, he found glandular tubercles in the shape of beans, but of various sizes; and in both these cases when the tubercles were pressed they wept a limpid fluid. Stegmannus observed the pancreas of a man sprinkled with tubercles which resembled millet seed; and, attached to a sac which had contained fluid, in the body of a maiden, Goetzius saw tubercles which varied from the size of a pea to that of the smallest hempseed. In some places they were solitary, and in others they were clustered, but all of them were scirrhus; and, when divided, they discharged no fluid or gelatinous matter. I have already related cases in which hard granules or tubercles were prominent on the inner surface of the peritoneum and pleura, when there had been serous effusion into the cavities which these membranes surround: and in those instances, the successive changes to which I have adverted, were exemplified. In a woman who died from ascites some years ago, the external coat of the intestines was occupied by numerous tubercles, and a portion of these viscera was brought to me that I might ascertain their nature. They resembled turgid lenticular glands, but they exhibited no orifice, and seemed to be constituted of an intermediate texture between glandular and fleshy substance. I considered them the remains of ruptured hydatids, which had contracted, but not to such a degree as to have become dry and hard. Their number did not deter

me from indulging this opinion, because I recollected that in a professor at Bologna, Coiterus found vesicles full of water adhering to the mesentery, peritoneum, intestines, spleen, liver, and indeed to all the viscera. Philippus Persius found upwards of nine hundred pendulous vesicles adhering to the kidneys, uterus, stomach, intestines, liver, spleen, heart, and pericardium. The patient was a young woman whose menses being suppressed, had become dropsical. In another woman, Mauritius Cordæus found the outer surface of all these internal parts loaded with pendulous cysts of different sizes and forms, filled with a citron-coloured fluid, and, in number, exceeding eight hundred. I might cite a third instance which fell under the notice of Ballonius, but the fluid had not been effused into the abdominal cavity. The woman was supposed to be pregnant, and the omentum, mesentery, peritoneum, liver, the spleen, the lungs, and the heart were beset with vesicles full of a limpid fluid.—35.

It is evident, therefore, that those parts which, in the maiden whose history I have given, were rough with tubercles, have been thickly bestrewed with hydatids in other dropsical bodies. Indeed the peritoneum is sometimes covered with so great a number as to be scarcely visible—a fact which Ruysch met with, and he has delineated the appearance. Paawius found this membrane and the omentum converted into filaments and vesicles, and lying in the cavity of the abdomen; so that neither of these parts occupied its natural situation.

Hydatids have frequently been found in the omentum, which is a production of the peritoneum; but its texture is so tender that in general it does not confine them long within its laminae, and on bursting they lacerate and destroy the substance of the omentum itself. I consider this one of the principal rea-

sons wherefore the omentum in ascitic patients is seldom discovered entire.—36.

Antecedent to the dissection of human bodies, hydatids were often found in the viscera of different animals, and still are often discovered in them. Among the number of largest hydatids, that must be mentioned which was found by Caldesi in the liver of an ox. Its total weight was nine pounds, and the heaviness of the membranes alone was sixteen ounces. It had three coats, each of which consisted of strong and fleshy laminæ. The external coat in particular was firm, muscular, and fibrous; the inner was weak and thin. The middle coat was of a golden colour and rugose, and some gypseous, or rather osseous matter adhered to it. Within these parietes a limpid and saltish fluid was contained, which did not change by mixture with different liquors; nor did it coagulate on boiling, any more than the fluid of other hydatids on which he made the same experiment. Cordæus found two membranes in the hydatids which he described; and one of them was of a very white colour, and the other was similar to the coat of the stomach. The magnitude of the hydatid seen by Caldesi was certainly favourable to the examination of its structure, but although I never found one so large as I wished, I have no doubt some of the appearances in that cyst were peculiar.

In a calf fifteen days old, I formerly saw one six or seven digits in diameter. It hung from the flat and upper surface of the liver, adhering to it by an extent of two or three digits, penetrating somewhat into its substance, and thence derived its blood-vessels. The water it contained was pellucid, and of a greenish colour, slightly inclining to yellow. Through the coats I could not only see this fluid, but every thing which floated in it, and the following distribution of vessels was apparent. Some

small trunks appeared to proceed from the liver, through the middle of the cavity of the vesicle, and having reached the opposite part they were reflected upon the exterior surface, where, being divided into smaller and larger branches, they made a beautiful network. Very slender striæ of fat accompanied these ramifications. In an old pigeon, which died suddenly, I found another hydatid, as large as a hen's egg, attached to the ovarium, and blood-vessels were distributed upon its surface. The interior of the hydatid was cellular, and a yellowish fluid was contained in the transparent cells. Some minute vitelli, similar to others abounding in the ovarium, though somewhat harder and whiter, adhered to that extremity of the membranes which was attached to the ovary. Other hydatids were connected to the ovarium by a peduncle of considerable length, and the fluid in none of them coagulated by boiling.—37.

I was accidentally prevented from examining the cells, and particularly regretted this circumstance because the hydatids which exhibit blood-vessels passing through the cavity, or which possess an internal cellular structure, cannot be ascribed to the mere dilatation of a gland from its duct being imperious. Nor can they be attributed to obstruction in an interstice between two pair of the valves of lymphatic vessels, an opinion suggested by Wharton to explain their formation; and the cords of these pellucid vesicles occasionally seen, rather sanction this opinion. Whilst I do not deny that hydatids may sometimes originate from a gland, and at others from an interstice, I cannot admit that all are formed in this way. Ruysch long since reminded us that a great number of hydatids had been found in the placenta, a circumstance I have also met with, and have likewise found them in other parts where there are

no lymphatics. He supposed that they originated from diseased extremities of vessels.—38.

Hitherto I have only spoken of those hydatids which were prominent on the surface of the viscera, or pendulous from their substance; but there are others which either lie within the substance of the viscera, or at least, are not very prominent. These most frequently occur upon the kidneys; and in my *Adversaria* I described them under the designation of large cells. I shall adduce examples of this description of hydatids.

An old woman who had an incurvation of the spine, and was lame, died in the hospital at Padua about the middle of March 1747. She had been brought in a short time before, under symptoms of an apoplectic character.

Dissection. The trunk of the aorta began to dilate immediately after giving off the emulgents; and a little above the bifurcation into iliacs, the dilated part was two digits in diameter. The inner surface of the vessel, where it was not dilated, and also within the part which had become expanded, was uneven and in one part ossified. From the lower extremity of the right kidney, an hydatid, the size of a small apple, protuberated. It was filled with a reddish fluid, and had two coats, the outermost of which was nothing more than the adipose substance of the kidney, and the other was the proper coat of that organ. There were smaller hydatids which had not elevated the membrane but were imbedded in the substance of the kidney.—*Morgagni*, xxxviii. 40.

On dissecting another aged woman, the left kidney was found greatly extended by an hydatid which contained four ounces of water of a slightly yellow colour.

Harvey and Doringius have described similar appearances. I have never met with an instance in

which these vesicles communicated with the pelvis or tubuli of the kidneys, nor do I know that any other person has discovered manifest communication. Platerus, indeed, has mentioned a case, but the communication resulted from ulceration, which had perforated the kidneys from the internal part quite to the exterior. This observation suggests another way in which hydatids of the kidneys may with greater celerity and certainty produce ascites, namely by communicating with the pelvis in consequence of ulceration. However, even when there is no ulceration, if the hydatids have destroyed or condensed a considerable part of the substance of both kidneys, there is no doubt dropsy may easily happen from the secretion of urine being greatly diminished. But if the hydatids burst and discharge their contents, and the emission of fluid continues afterwards, ascites must ensue.

—41.

If, instead of continuing to secrete, they coalesce, in consequence of the substance of the kidneys springing up around them, when they are emptied, dropsy does not ensue; because the small quantity of fluid, which they had discharged, is taken up by the absorbents. A cicatrix, however, remains in the kidney, varying in its extent and depth in proportion as the ruptured hydatid had excavated the substance of the kidney. I have already mentioned a case in which a long tendinous line, resembling the cicatrix of an old wound, was drawn along the surface of the kidney, and penetrated deeply into its substance; and I shall describe other cicatrices of the kidneys which were not so deep, but depressed and circular. I presume that the cicatrices of other viscera may be explained in the same way as those so often met with on the kidneys, provided no symptoms of a wound or ulcer had preceded. In the present article I have mentioned the appearance of a cicatrix in the side of the uterus, which probably arose from an

hydatid, for it is unquestionable that the uterus is sometimes the seat of hydatids. Coiterus saw one pendulous from the cervix uteri, apparently larger than the urinary bladder. It had two coats and was filled with a transparent fluid.

Cicatrices of the same description occur in the liver and spleen, but we must guard against being deceived by unusual fissures which may have existed from birth. On the surface of these viscera, and also buried in their substance, large hydatids have often been found. Under the spleen of a man who had been hanged, Coiterus found them as large as a fist, full of water, and separable from the adjacent parts without injury. A case occurred to Lyserus in which, during the patient's life, more than three pints of a citron-coloured fluid burst from the liver, on its substance being deeply penetrated. I have observed this morbid appearance in other cases in the human body, and also in the liver and spleen of pigs. In the liver of one of these quadrupeds, the number of hydatids was great, and they were of various sizes. Some were half buried, and others entirely concealed within the substance of the liver; and the water of them all was contained in a very thick and white follicle.—42.

The abdominal organs are not the only viscera in which hydatids, and the cicatrices which ensue from their rupture, are found. That they may form upon the lungs, and even upon the heart, I have already shown from the observations of ancient and modern anatomists, and also from my own dissections. The hare is said by Redi to be frequently affected with hydatids, and on the heart of one of these animals I found a cicatrix. That the second species of hydatids occasionally exists in the lungs may be inferred from the water accumulated within them in a kind of sac, a circumstance witnessed by Senac twice.—43.

Hydatids exist in another form to which I must advert. In hares, Redi found them in clusters and united to one another, not only buried within the substance of the liver, but also beneath the external coat of that organ, and of the whole alimentary canal. He also found them unadherent between the folds of the mesentery, and many were loose within the cavity of the abdomen like animalculæ which had the power of loco-motion. Tysonius mentions a case in which five hundred were discharged from the side of a woman, a little below the spurious ribs. They were full of limpid water, and a great quantity of the same fluid accompanied them. In the omentum of a woman, Hunerwolffius found hydatids, which, besides a white mucilaginous liquamen, contained other more slender vesicles full of lymph. Hartmann found them in the same membrane of a dog. The liquor contained in them did not coagulate by boiling, and the parietes of each hydatid were composed of several membranes, and were so dense that on being divided they did not collapse. They felt somewhat greasy; and, when boiled, a large quantity of fatty matter separated from them.

Alexander Camerarius found a considerable number within a membranous sac, which at the same time contained steatomatous tubercles. They were filled with a limpid water, and unconnected with each other. Morand has described vesicles which are found in great number under a single coat, either connected together or separate; and swimming in a fluid similar to that which they contain, or which they have poured into the abdominal cavity.—44.

These vesicles are sometimes found in great numbers in cases of ascites; and, in general, when hydatids produce dropsy, or when they are combined together, of whatever description they may be, if they are very numerous, or of a large size, perforation of

the abdomen will be in vain. Besides the circumstance that those already burst may continue to discharge fluid, the opening of one vesicle does not evacuate the rest, not merely when they are entirely separate, but even when they adhere together like bunches of grapes.

I have already produced an adequate number of examples of hydatids in other parts of the abdomen, and shall only cite one in addition, relating to the stomach, from Jacobus Yongius. The subject of this extraordinary case was a woman, who, through the entire duration of the disease, voided as much water as the fluid she drank, and yet paracentesis was performed twenty-nine times, and two hundred and fourteen quarts of fluid were drawn off. A great number of hydatids were found on the stomach and intestines.—45.*

* Dr. Monro, who has written a very good account of human hydatids, divides them into seven species.

1. Where there is only one large hydatid, of a globular form, contained within a cyst.

2. Where there are several hydatids within the same cyst, of different sizes and colours, some being of a pearly, and others of a straw or amber colour; and some of the larger are found to contain others.

3. Where a number of hydatids are inclosed one within another like a nest of pill-boxes; but neither Dr. Baillie nor Dr. Monro appear to have seen this species.

4. This kind, he says, may be called cellular, as it is peculiar to the cellular substance of the muscles. The cyst is of considerable thickness, and consists of several distinct layers, which sometimes acquire a cartilaginous hardness.

5. Owing to this kind being compressed together, and forming a substance about the size of a garden pea, it has been mistaken for an indurated lymphatic gland. The hydatids are firmly united to each other by adhesive mucus, and by a thin membrane; besides which, each of them is enveloped with its proper capsule. These hydatids are very small, being about the size of the ovula in the ovaria of fishes.

This kind is often found in the choroid plexuses of the lateral

Dropsy of the peritoneum.

I shall subjoin two cases of dropsy of the peritoneum, a disease which has not been described in the

ventricles of the brain, in cases of apoplexy and hydrocephalus.

6. In this species the hydatids are united laterally to each other. It is a very rare variety. Dr. Monro had only met with two examples, and in both they were connected with the liver: but, at the same time, there was a great number of hydatids of different sizes attached to the peritoneum, and others were floating in the cavity of the abdomen.

7. A kind of hydatids with narrow necks, frequently attached to the placenta; where Dr. M. has found those of the second species.

Although Morgagni has represented the fluid contained in hydatids as incoagulable, and the same remarks have been made by Dr. Jenner and others, yet it is probable that it does generally congeal by heat, acids, and ardent spirits, though not in an equal degree with serum.

Hydatids must be distinguished from mere vesicles which are sometimes found in the viscera, especially in the kidneys and ovaria, in which parts the genuine hydatid is rarely found. These vesicles have only one coat, they are not enclosed within firm cysts, do not propagate, nor possess any degree of contractile power, like the true hydatid. Morgagni appears often to have confounded these morbid productions.

The cyst of hydatids seems to be formed in consequence of irritation, and by condensation of the cellular substance. It is laminated, and sometimes feels as hard as cartilage.

The outer coat of hydatids is thicker than the inner, and sometimes there is a variation as to transparency in different parts of the same coat. The inner coat is very thin, semi-transparent, soft, pulpy, and very tender; and, in very large hydatids, possesses a small share of elasticity. Small hydatids are often seen adhering to the coats of larger hydatids. The outer coat is sometimes converted into bone.

The cyst occasionally expands to such an extent as to contain many quarts of hydatids. I met with one instance in which the abdomen was as large as that of a woman at the completed term of utero-gestation. The enlargement was occasioned by a cyst containing hydatids from the bulk of a moderate-sized cherry to that of the fist, and they floated in an opaque fluid. Nearly ten quarts of these contents were removed, and the cyst collapsed. Its inner surface was rugged, and lined with flakes of lymph.

most ancient authors, though some have supposed that cases of it may be distinguished in their writings. Joannes Acholzius, a physician at Vienna, I

Dr. Baron has recently published a Treatise on the tubercular Accretion of serous Membranes, and on the Origin of Tubercles and Tumours in different Textures of the Body : and although it is probable that the whole of his theory cannot be substantiated, the work is interesting and valuable. The second chapter is on the origin of tubercles, and on the connexion between them and hydatids. As tubercles are found in almost all textures, he infers that their origin must be connected with some of those elementary parts of our frame which are diffused through the body, and enter into the composition of every organ ; as is the case with the sanguiferous, the nervous, and absorbent systems.

When hydatids exist, "sooner or later," he says, "conversion takes place, and the limpid contents are changed into substance of every different characters, and occasion tumours and tubercles, and other disorganizations which it has been customary to ascribe to causes of another kind. They commence in an opaque spot, their coats thicken, and their contractile power is destroyed. Their conversion is sometimes into a substance resembling cartilage, possessing both its density and colour. Sometimes there are signs of ossification—sometimes a pulpy substance resembling scraped cheese is met with—sometimes a fluid like cream—but, at others, the fluid resembles a mixture of blood and water, or is transparent and glairy, like the white of an egg. With these, gritty or earthy concretions are frequently found."

Clustered hydatids, he says, sometimes exhibit these different conditions at the same time.

Dr. Jenner fed rabbits on a particular sort of food, and the liver soon became studded with hydatids ; and by examination, at different times, he was enabled to trace the gradations already mentioned, from the first inspissation of their contents, and thickening of their coats, to the final conversion into tubercles of varying size and hardness. Small hydatids, he says, sometimes unite in clusters, and ultimately form what has been called a scirrhous tumour.

Dr. Jenner applied the facts which he adduces on this subject to explain the origin of tubercular phthisis, and produces an example taken from a young heifer, in which the lungs were apparently tuberculated, and in some of the tubercles he found hydatids. He also endeavours to illustrate the connexion of these productions with the lymphatic system.—*Ed.*

believe, first described it. In the year 1581 he presided at the dissection of a dropsical woman, and found a great quantity of fluid, like a lixivium, not in the cavity of the abdomen, but between the peritoneum and the integuments. The muscles were so greatly extenuated, by distention from the subjacent fluid, that they appeared almost annihilated, or were partially converted into a continued body, made up of vesicles filled with water, mucus, and glandular matter, and composed the anterior paries of the very large cavity. The inner paries consisted of a membrane with which all the viscera were covered, so that when the cavity was laid open no viscera were seen. Cases are related in the *Sepulchretum* which I have no doubt are of the same nature as this. If I am not greatly deceived, the instance of dropsical affection in a maiden of rank, which was observed by Hoechstetter, appertains to this species. The case was published many years afterwards by his grandson, who supposed the fluid to have been situated between the peritoneum and omentum. The sac contained a large quantity of a thick and offensive humour, and the posterior part is said to have exhibited a great number of glandular tumours, and four of the largest of them were in a state of supuration. As he reports that the internal part of the sac was a membranous expansion which covered all the viscera, I believe it was the peritoneum; though it might possibly have had the omentum adherent to it.—*Morgagni*, xxxviii. 47.

In two hydropic women, one dissected in 1601, and the other in the following year, Paavius mentions that he found no trace of spleen, kidneys, and liver, except a few of the veins of the latter viscus; but it is most likely that the peritoneum had been distended by a great quantity of fluid, and that although the membrane had ruptured, it remained attached to the viscera which were sup-

posed to be wanting. On examining the body of a woman whose abdomen had been exceedingly tumid for two years, Dodonæus found that the intestines had burst; and a black intestinal sordes, to the quantity of sixty pounds, occupied the abdomen. The peritoneum was fissured, in some places, from the upper to the lower part, and the omentum was reduced to putrid fragments; but the viscera were sound. Although this large swelling had afflicted the woman so long, yet she retained a healthy countenance, there was no morbid appearance in the urine, nor any œdema of the feet. We shall observe, hereafter, that these circumstances, and also the protracted immunity from visceral lesion, are indicative of dropsy of the peritoneum. The peritoneum being urged inwardly, may adhere to a portion of intestine and that kind of lesion may result, by which the texture of both may be destroyed, and the feces pass into the fluid distending the peritoneum. This fact Chomel observed in a woman whose abdomen began to swell after parturition.—48.

In the year 1651 the disease was seen by Tulpus, and soon afterwards an account of it was published under the new appellation of *Hydrops peritonæi*, and in that dissertation it is affirmed that all the water was accumulated between the two coats of the peritoneum, which had acquired the thickness of the ring finger. The case was afterwards published more in detail by Job Meckren, who dissected the body. In the body of a woman dissected by Bogdanus, the peritoneum was as thick as a man's thumb, rugose, and rigid; and he says that a fluid resembling lees of oil was contained, not between the coats of the peritoneum, but between the peritoneum and the fascia of the abdominal muscles. That which Tulpus and most others after him had considered the external lamina of peritoneum, he regarded as

the coat of the muscles. Rudbeck and Blasius maintained that dropsical effusion might take place between the peritoneum and the abdominal parietes, and the latter adduced an instance. He admits, however, that the same thing might occur between the laminæ of the peritoneum. The external part of the cellular texture, which adheres to the muscles, is frequently so dense and thickened in these cases, as to be mistaken for a layer of peritoneum, and sometimes for the entire membrane.

Amongst others by whom this error seems to have been committed is Paulus Mothius, who speaks of a matron in whom a large quantity of water had accumulated between the peritoneum and a rather dense membrane covering all the viscera, and filled with numerous and large veins. Within this membrane a large abscess had formed in the region of the liver, and three smaller abscesses occupied the lower part of the membrane, near the groins. This case was published about the year 1657.—49.

Although several cases have been published since those alluded to, this seat of dropsy has always been observed in the female sex, with the exception of one single instance. It has never fallen under the observation either of Valsalva or myself, but it was twice seen by Mediavia, in this hospital, and he has favoured me with the following particulars relative to them.—50.

CASE 1.

A woman not advanced in years, and whose complexion was healthy, had tumefaction of the whole belly. Before this occurred, she perceived a kind of tumour on the left side of the umbilicus, uneven on its surface, and of such a magnitude that it almost equalled the breadth of her hand. Although she

was supposed by some to labour under ascites, others doubted this opinion on account of the natural complexion of her face.

Dissection. As soon as the transverse muscles of the abdomen were cut into, a great quantity of exceedingly offensive water, which had been separated from the cavity of the abdomen by the peritoneum, burst forth. When this had been exhausted, the tumour of which the woman had spoken came into view. It consisted of two or three large vesicles formed in the peritoneum; and the parietes of them were so thick, that on drawing out the water, their coats did not at all subside or collapse.

Morgagni, xxxviii. 51.

CASE 2.

Another woman, fifty years of age, came into the hospital in 1725, about twelve years after the former. At the age of forty she was afflicted with tumours in the upper part of her belly. They were somewhat distant from each other, and not free from pain when touched. Various remedies and applications were employed, yet she progressively grew worse, and the tumours coalesced into one. Even then, although the whole abdomen was distended, it was easy to distinguish the tumour with the eye as well as with the hand. It was situated between the cartilago ensiformis and navel, and was still painful on pressure. The colour of the skin was unaltered, and it was not practicable to raise the skin with the fingers, consequently, some conjectured that the tumour was in the muscles of the abdomen; but as the woman's complexion was somewhat sallow, and her breathing exceedingly difficult, others supposed that she was the subject of organic lesion; but there was no indication of disease in the stomach or intes-

tines. At length, vomiting of black matter was added to the slight febrile symptoms under which she laboured, and death terminated her sufferings.

Dissection. The abdomen was not so tumid as it had been during life. When the integuments, the muscles, and the tendon of the transversales abdominis, were accurately separated, a thin membrane appeared to lie under those parts. Between that membrane and another which in thickness was equal to a line and half of the inch of Bologna, there was a cavity containing a lunated cyst, which not only raised the external membrane, but also extended downwards and to the sides, and contained a large quantity of water which in colour resembled that in which fresh meat has been washed. Its odour was exceedingly offensive, and the part into which subsidence had taken place, was of a purulent consistence. The quantity might be computed at thirty pints, but most of it had been effused into the cavity of the belly, in consequence of the ulceration of the posterior membrane of this morbid cyst, contiguous to the stomach. This opening, I suppose, was formed about the termination of the disease, and in consequence of that circumstance the abdomen appeared to be less tumid.

The tumour of the epigastrium was constituted of a firm and hard substance of a yellowish white colour, and, in some places, a few cells were observed. Ulceration had commenced in the membranes surrounding the cavity in more places than one; and the surfaces facing each other were rough, and began to assume a livid appearance. The abdominal surface of the posterior membrane was smooth, except at certain parts where it adhered to the omentum and large intestines; but this connexion was not very firm. There was also a small band united at one extremity to the same membrane, and

by the other to the lower vertebra of the loins. When dissected its vessels effused blood. The intestines were somewhat inflamed. The liver was pallid, and grated under the knife, as if sandy particles had been blended with its substance.

Morgagni, xxxviii. 52.

Various causes of this form of dropsy have been assigned. It has been ascribed to a rupture of absorbents between the abdominal muscles and peritoneum, and between the laminæ of the peritoneum; and it has been supposed that obstruction in these vessels was very liable to take place in gluttons and in pregnant woman, from compression. Not a few of the preceding cases occurred in women who had borne many children, and in some the disease commenced a little after abortion, or after laborious parturition. But although I readily admit utero-gestation among the causes of this dropsy, and some of the women in whom it occurred were parturient, I do not understand why it has happened but once in the other sex.—53.

In consequence of the sac having been found connected to the ligaments of the uterus, to the ovary, and also to the fundus uteri, it has been attributed to the uterus. Sponius has recorded an instance in which the sac of the peritoneum communicated with the cavity of the uterus, so that from the genital organs the patient had constant dripping of a serous fluid which resembled that contained in the sac, amounting to a hundred and forty pints. The communication between it and the uterus was demonstrated by passing a probe through the channel, which it is probable was formed by the parietes of the Fallopian tube having extended into those of the sac.

An obstruction to the return of blood from the ovary through the spermatic vein, which creeps be-

tween the laminæ of peritoneum, has likewise been mentioned as a cause of peritoneal dropsy, and it is possible that serum might be deposited from this cause, and also from obstruction in other veins corresponding with it in situation. However, it appears that neither the uterus nor the ovaria were at all implicated in most of the cases to which I have referred. In addition to the two sources already mentioned, we must therefore inquire after others that are either peculiar to females, or more frequent in them than in the other sex.—54.

The monthly determination of blood to the lower parts of the abdomen, the sedentary life, the feebler power of resisting the causes of diseases, whether external or internal, and the abominable practice of confining the abdomen with stays, especially those which are stiff and hard, may be enumerated amongst the circumstances which render females most liable to this disease. Not only may lymphatics be constricted or ruptured from the compression of these stays, but obstructed lymph or blood may prove the origin of tumours, which by their enlargement may separate the peritoneum from the muscles, so that, branches of lymphatics being ruptured, dropsy may ensue: and the same vessels having suppurated, the affection is increased by purulent discharges. I perceived tumours of this kind in a matron of rank who had been compelled to wear unyielding stays from an early period of life. In several of the cases of peritoneal dropsy accompanied with tumours, the latter were situated in those parts of the abdomen most compressed by this article of dress.—55.

When tumours form, however, they tend to occasion dropsy of the peritoneum, not only by disjoining parts naturally united, but also by impeding the transmission of lymph and blood. Most frequently they appear of a glandular nature, or are constituted of

cells, vesicles, or globules. Thickening of the peritoneum Malpighi ascribed to the glandular nature of this membrane, and if this is admitted, we may easily conceive how greatly secretion will be increased by an augmentation of the secerning organs, especially when we consider the great dilatation of vessels which is connected with it. Varices have been noticed in the epigastric veins the size of a filbert; and both the epigastric and mammary have been found as thick as the little finger.—56.

The disposition of the secerning organs, in consequence of their morbid condition, united with a diversity in the state of the blood, will tend to explain the various appearances of the humours or fluids, in different cases. Instead of a limpid and fluid serum, it has sometimes been found to resemble jelly, and at other times pus.*—57.

It will be proper to subjoin a few remarks relative to the symptoms. It may be distinguished from ascites by these marks. *First.* Almost all the examples show that it increases more slowly than effusion into the abdominal cavity, especially at the beginning. *Secondly.* The face retains its natural complexion. *Thirdly.* The strength and motions of the body coincide with the appearance of the face; and, in general, the functions of the kidneys and uterus are unimpaired. *Fourthly.* There seldom is any œdema of the feet, except near the termination of the disease, and even then it is not a constant occurrence. In general, there is no wasting of other parts of the body, no difficulty of breathing, no fever, nor any pain, till the disease is at an advanced stage; when all

* Hydatids have occasioned accumulations of fluid in the situation alluded to. A case has been related by M. Bourdet, in which about twenty pints of a serous fluid, containing a prodigious quantity of hydatids, were removed from between the peritoneum and abdominal muscles.—*Ed.*

these symptoms usually appear, especially, if, in addition to the serous fluid, there are suppurating tumours, and the sac ulcerates. *Fifthly.* Medicines are of no avail, for if we attempt to augment the discharges by the bladder or intestines, the abdominal tumour is not diminished, and if any violent remedies are employed the strength of the patient decreases, and the misery is aggravated. I do not recollect to have read of one patient having been even relieved whilst labouring under this disease—a circumstance which frequently happens in ascites.—58.

We must endeavour to distinguish dropsy of the peritoneum from that of the uterus, of the Fallopian tubes, and of the ovaries. Most of the preceding symptoms have been said by Nuck to belong as much to them as to affections exterior to the peritoneum. The additional distinctive marks in this case must be derived from the inspection of the abdomen, and its examination with the hand. It has been said that in cases of peritoneal dropsy there is flatness at the umbilicus, in consequence of the peritoneum not separating from the tendons of the abdominal muscles at this part; but many cases are opposed to this opinion. The celebrated Anhornius has related one which affords the most certain example, and it is the only unequivocal instance I have met with, of peritoneal dropsy in the male. A young man who had repeatedly been affected with anasarca, was supposed to be ascitic. He had a projection at the navel the size of the fist, and when it spontaneously ruptured, a great quantity of serum issued from the fissure, and health appeared to be restored. At the expiration of two months the navel started again, and this renewed accumulation of fluid was discharged a second time. A third time the part became distended, but the patient had now become tabid,

and though the fluid escaped in the same manner as on former occasions, it did not avail to prevent a fatal termination. On dissection, no serum occupied the abdomen, but whatever remained of this fluid was found between the duplicatures of the peritoneum, where many lymphatic tubuli or glandular knots were found, which, on being pressed, wept a limpid fluid.

Other symptoms of this disease have been mentioned, namely, the abdomen preserving nearly the same figure, when the situation of the body is changed—the peculiar circumscription of the tumour—and fluctuation being indistinct or imperceptible.—59.

It can seldom happen that all these symptoms should prove unavailing in the diagnosis, especially if we closely attend to the circumstances at the onset; observing whether the enlargement commences in the epigastric region, or, should it begin in the hypochondrium, whether it is immoveable when the woman, being in a decumbent position, turns herself from side to side: and also, whether no sensation of weight is occasioned when the patient stands upright, nor any difficulty of micturition. When the disease is at an advanced stage there may be other marks from which we may infer that certain parts are not affected. We may take the uterus as an example, and should menstruation continue regular we may conjecture that this organ, the Fallopian tubes, and the ovaria, are neither dropsical nor the seat of any other tumour. However, it is necessary to compare a greater number of histories and dissections, to enable us to determine which of these symptoms can be most relied upon.—60.

Before attempting to remove this disease, it is requisite to inquire whether there was any hardness or tumour at an early period, which the greater distention might conceal: and, likewise, whether, inde-

pendently of distention, the patient is annoyed with any considerable pain, arising from ulceration of the ovary; whether much pain is excited in any part of the abdomen, when it is strongly pressed with the fingers; and whether the bulk of the abdomen is unequal in consequence of the fluid being encysted: for in this case the fluid may resemble gluten or frog's-spawn, and the separation into partitions will prevent its being drawn off. Although this differs in its contents and divisions from the more common form of dropsy of the peritoneum, yet it is engendered in this membrane.—61.

Nothing except paracentesis can be of any use, and whenever this operation is considered expedient, it may be performed with the utmost safety, as the viscera are separated from the fluid.—62.

There are other forms of encysted dropsy to which it is proper I should advert. Schefflerus published a dissertation on a case in which a large quantity of fluid had accumulated between the duplicature of the peritoneum, and had formed a sac from which a steatomatous tumour arose.

Anhornius met with almost an incredible quantity of fluid which was confined between the peritoneum and omentum, and the latter was exceedingly hard. Although the woman in whom this circumstance occurred was emaciated, her countenance was tolerably healthy, and her feet were not œdematous.

The younger Du Verney relates the particulars of a woman, thirty years of age, whose abdomen began to enlarge seven years before her death. Her countenance was healthy, her appetite unimpaired, she slept well, and was active. After death a large sac was found in the abdomen, containing numerous cells which did not communicate with each other. Each of them was filled with a peculiar matter quite different from the rest. This appear-

ance coincides with the circumstance, that the serum drawn off at different times presented a variety of appearances. The same author dissected a woman having ascites, in whose abdomen he also found a large cyst full of reddish serum.

There are also encysted dropsies, in which it does not clearly appear whether they belong to the first or second species.—63.

Dropsy of the ovarium is arranged with encysted dropsies, but it will come under consideration more naturally in the next chapter, when some additional observations will be made relative to encysted dropsies in general.

SECTION VIII.

ON TYMPANY.

An excessive inflation of the stomach and intestines is sometimes joined with ascites; and in tympanitis, a redundance of fluid is likely to be effused into the abdominal cavity. In the woman whose case is subjoined, the quantity of serous effusion was but small.

CASE 1.

A woman about thirty years of age was affected with humid scabies after protracted pains in the limbs. When this was removed by an empirical application, acute fever, accompanied with severe pain in the head, supervened. To these symptoms were added delirium, considerable difficulty of breathing, slight swelling of the whole body, with considerable tumefaction and great uneasiness of the abdomen. She died on the sixth day after decumbiture.

Dissection. No serous fluid issued from the cel-

lular substance when the abdominal integuments were divided; and when the feet were compressed, the part did not pit; therefore the general swelling which has been mentioned did not arise from anasarca. The abdomen was tumid and exceedingly tense; and when it was opened the intestines and stomach burst forth, and were found to contain nothing except flatus. However, with this they were distended to such a degree that the stomach filled more than half the cavity of the abdomen. About a pint or two of limpid serum had been deposited in that cavity, and when first exposed to the fire it appeared to concrete slightly, but afterwards, almost like the water of the pericardium, it entirely evaporated, leaving only a yellow pellicle at the bottom of the vessel.

The lungs adhered to the costal pleura by membranes which resembled a gelatinous substance. When they were cut into, a pellucid serous fluid escaped. The right side of the heart was connected to the pericardium by some membraneous filaments, and the ventricles of the heart contained fluid blood. The head was not opened.—*Morgagni*, xxxviii. 22.

In this case there appears to have been an unusual tendency in the air to rarefaction, so that even the vessels ramifying beneath the skin seemed to have been expanded, and a slight degree of emphysema was occasioned. There seems also to have been an irregular distribution of the nervous principle, by which some parts of the intestines were contracted, and their natural action suspended; so that the gas which was accumulated and rarefied in the bowels was not expelled. "Many observers tell us," says Corn. Henr. Velse, "that when one part of the intestines is flaccid, soft, and distensile, in another place they were hard, contracted, and rugose, and would not allow any fluid to pass;" and this circum-

stance I have often seen in my dissections. He afterwards adduces a case which shews what elastic air, when enclosed, and progressively expanded by the heat of the place, may effect. *In puella bienni vidi*, says he, *portionem intestini coli adeo violenter ab incluso aëre amplificatam, ut referret vesicam constantem tunicis ob summam elongationem quam pellucidissimis, reliquo ejusdem intestini tractu et supra, et infra hunc tumorem, per summam contractionem extrinsecus sulcato, et prorsus impervio.* I scarcely need intimate, that when constrictions of this kind are relaxed, as happens in those who recover from the disease, the fibres are extremely weakened.

The colon has been found equal to the size of a man's thigh; and the stomach so much inflated as to expose the patient to imminent danger.—23.

There is another species of tympany in which the air is contained within the cavity of the abdomen, and if the abdominal muscles are unnaturally flaccid, the distention will take place with proportionately greater rapidity, and the parietes will undergo a relative degree of extension. This species of tympany does not often occur, either when alone, or when conjoined with the former. Indeed it is so rare an occurrence, that neither Willis nor Littre had seen it; and whilst the former did not believe it possible to occur, the latter affirmed that its existence was refuted by his experiments. However, others do not doubt that gas may be extricated from humours effused into the abdomen and decomposed by putrefaction; or that it may issue from a perforation in the intestines, which is the more easy method of explanation. In some intestines, extremely distended from this disease, Haller found that the air had insinuated itself through the parietes into the cells immediately beneath the outer coat. And Spöeringius has related the case of a man whose colon

being filled with excrement, gas had so far expanded the intestinal canal above this obstruction, as to be only confined by the outer coat. It is easy to conceive how little remained to prevent its bursting into the abdominal cavity.

But the coats of the intestines may not only be perforated by the gas itself, but openings might be effected by ulceration, or gangrene, and an exit thus given to the flatus; and this has happened more than once in the stomach. The same thing, however, might occur, even when these parts are not perforated. When gas occupied the abdominal cavity, Mead found the intestines gangrenous; and, under similar circumstances, Gullman represents the same viscera as being turgid with flatus, inclined to gangrene, and their external surface covered with a morbid humour. Mercklinus found nothing except extreme inflation in the stomach and bowels; but in a case mentioned by Heister, these viscera are said to have been in a perfectly healthy state. From the two last instances, and others of the same nature, we may suppose that sometimes there are sources of gas with which, at present, we are unacquainted. We occasionally see flatulent distention of viscera, and why may not air be deposited in the cavity of the abdomen as in other parts? By Fantonus, the gall-bladder, for instance, was found turgid from gas confined beneath the external coat; and his son more than once saw almost innumerable small vesicles, of different sizes, beneath the external membrane of the liver and spleen, and more particularly of the mesentery; and this appearance has been noticed by others. He conjectured, that as water continuing to distil into the abdomen from ruptured hydatids occasions ascites, so, air bursting from these ruptured bullæ, if it does not cease to rush into the abdominal cavity on its separation from the blood, will bring on tympanites. However, if we cannot under-

stand the cause of this phenomenon, the effect itself cannot be denied. The tumified abdomen has sometimes been pricked after death, and has immediately subsided with an explosion. This fact was witnessed by Ballonius, Vallesius, and others; some of whom found air in the cavity of the abdomen when the intestines were distended with it, or when a serous fluid had been effused.—24.

In the cases referred to, there was no reason to suspect that the intestines had been wounded. This could not happen when they were removed from the peritoneum by ascites; and even when they are pricked it is only that gas near the orifice which immediately escapes.

A case is related by Heister, of a woman whose abdomen had been exceedingly distended, and who died suddenly. As soon as a small wound had perforated the peritoneum, gas rushed out, and the abdomen subsided, but the intestines were found in a healthy state. Among other physicians and surgeons, Ruysch and Heister were present; therefore, it is not very probable that any deception had occurred. It cannot be suspected that the gas in these cases had been extricated after death, because the distention had existed long before the fatal event. Flatulent external tumours in the scrotum, and in other parts of the body, have been acknowledged by most surgeons: and in the last illness of a girl whom the younger Du Verney saw, it is unquestionable that inflation had taken place, and it increased, with an undulating appearance, till, at length, it occupied the whole trunk of the body. When pressed, the sensation of air moving away, with a kind of crackling noise, was felt under the finger; and as soon as the skin of the abdomen was cut through, an intolerable stench burst forth, and the whole tumefaction vanished.

The difficulty which has been experienced in curing both species of tympanites, is demonstrated by the remedy which even men of eminence have sanctioned, namely, paracentesis; but, so far as I know, none of the more cautious surgeons have been found, who were willing to thrust a perforating instrument into the abdomen, without knowing what parts he might wound. Certainly he could not be regarded as a circumspect practitioner, who, mistaking tympany for ascites, perforated the abdomen, under the direction of Van Helmont, and, of course, looked in vain for the exit of water. Having withdrawn the trochar, the abdomen immediately subsided, and the patient died soon afterwards. The gas which escaped was exceedingly offensive, and of a cadaverous odour. The escape of air may afford temporary relief, but if the intestines are punctured, their other contents may be effused into the belly, and speedily bring on fatal disease in the viscera.

The needle might enter the intestine where, though there may appear the greatest distention, there may in reality be the least; and it does not happen, in all cases, that there is a great quantity of gas, and but little else, in the intestines of tympanitic patients; for they have been found half full of viscid or thick and frothy matter; of a pale yellowish colour.

The danger which may arise from perforating the abdomen in the other species of tympany, may be inferred from what has just been said; and it is very difficult to distinguish the two species. On these subjects, and also on the general treatment in tympany, Zeviani has written with much acumen and ingenuousness, as well as skill.*—25.

* The stomach and intestines are not unfrequently found distended with gas. It may not only be formed by a new chemical

SECTION IX.

CONTUSIONS AND WOUNDS OF THE ABDOMEN.

Contusion of the abdomen.

The consequences arising from blows in the abdomen sometimes prove fatal within a few days; but, at other times, immediate death results without any other obvious injury than ecchymosis on some of the viscera. Contusions are said to lay the foundation of visceral scirrhi.—*Morgagni*, liv. 15.

It will be shown presently, that the viscera are liable to be ruptured by violent blows on the abdomen; but occasionally other lesions ensue. A boy had the wheel of a carriage pass over his belly, but he dragged on existence for a considerable time. None of the abdominal viscera were injured, but a large abscess was found between the abdominal muscles and peritoneum.—17.

arrangement of the contents of these viscera, but it also frequently happens that air is separated from the blood in the gastric vessels, and is poured by the small exhalents into the cavity of the stomach. The existence of air in the abdominal cavity, independently of its escape through the parietes of the stomach and intestines, is very uncommon; but *Morgagni* has shown that it may occur, and probably, under these circumstances, it is secreted by the small vessels of the peritoneum. Various facts presented themselves to Mr. Hunter, which convinced him that air is often secreted by animal organs, or separated from the juices which are conveyed to them. In cases of dyspepsia I have known extreme inflation not only take place rather suddenly, and without an obvious cause, but sometimes the gas has been removed without an expulsion of flatus at all commensurate with the distention and distress.

Tympanitic inflation of the intestines is often symptomatic of chronic inflammation and annular contraction of some part of the bowels, especially in the colon; and most frequently the contraction takes place at the sigmoid flexure.—*Ed.*

CASE 1.

Wound between the abdominal parietes.

A young man, twenty-two years of age, was wounded in his groin by the horn of a cow. He had fever, and by degrees his face and the remainder of the body began to swell, but the swelling was not strictly œdematous. Besides this, nothing of importance resulted till the seventeenth day, when respiration became difficult, and these affections were accompanied with pain, and the sensation of a bolus occupying the fauces. He was also occasionally agitated by tremor, and the tumefaction of the body not only continued but increased. The swelling which occupied the groin extended, and he died about the twenty-second day.

Dissection. The wound began near the abdominal ring, and extended between the rectus muscle and the tendons of the obliqui; and in this space a considerable quantity of coagulated blood was found. The intestines were greatly inflated; there was a copious redundancy of serum in the abdominal cavity, and a similar effusion had taken place into the thorax.

Valsalva, liv. 2.

CASE 2.

Gun-shot fracture of the os ilium.

A man, forty years of age, was wounded by leaden shots discharged from a pistol, at the margin of the right os ilium. At the expiration of some days, fever accompanied with violent rigor came on, and the attack recurred every twenty-four hours, till about the fourteenth day, when respiration became difficult, and he died in three days.

Dissection. The wound had not penetrated the abdominal cavity, and the viscera were uninjured. The lacerated part abounded with shots, and by them the margin of the ilium had been shattered.

. *Valsalva*, liv. 4.

CASE 3.

Gun-shot wound of the abdominal parietes, producing suppression of urine and spasmodic affections.

A man, forty years of age, was wounded by the fragments of lead discharged from a musket. They entered the left nates by three foramina, and passed out at the lumbar region, near the lowest rib, by two. About the fifth day suppression of urine came on, and the patient complained of a spasmodic pain at the upper margin of the os ilium, on which part he could scarcely bear any pressure. The pain increased every day, and the convulsive affections became more violent, as well as constant, especially about the throat and mouth; but he retained the exercise of his intellectual faculties. On the thirteenth day he died.

Dissection. None of the pieces of lead had entered the abdomen, but one of them, departing from the course of the others, had penetrated the upper margin of the os ilium, and fractured it. There was no appearance of injury within the abdomen, except sugillatio of the intestines, and, more especially, of the omentum. The cerebrum was perfectly healthy.

Valsalva, liv. 22.

CASE 4.

Wound penetrating the abdominal cavity.

A young man, twenty-three years of age, was wounded in the abdomen, four digits below the na-

vel. Vomiting came on, and a portion of omentum protruded. A short time after the infliction of the wound, diarrhœa supervened; and the upper part of the abdomen became slightly tumid. In addition to these circumstances, he, at length, experienced difficulty of respiration; he had frequent cough, attended with purulent expectoration, and troublesome pain in the right side of the thorax; and ultimately these diseases proved fatal.

Dissection. Pus was found within the abdomen on the right side. It was situated between the peritoneum and mesentery, precisely as if it had been contained in a follicle, extending itself from the lower part of the abdomen, under the liver, to the diaphragm. The corresponding cavity of the thorax was filled with pus, which seemed to have penetrated the chest, about the right appendix of the diaphragm, although there was no obvious communication between the thorax and abdomen. Neither the intestines, nor any other viscera, appeared to have been wounded.—*Valsalva*, liv. 6.

CASE 5.

Punctured wound of the stomach.

A little after having eaten his supper, a man received a wound from a sharp instrument, which was thrust into the abdomen at the epigastric region, but a little to the left side. He instantly vomited, and the matter ejected was not bloody, but a considerable quantity of blood issued from the wound. On the second morning he rose from bed and had a natural dejection, but on returning to bed he fainted and expired. This event happened thirty-six hours after he received the wound.

Dissection. The cavity of the abdomen was filled with extravasated blood. The omentum was slightly

injured, and the stomach was perforated by a wound the breadth of a filbert.—*Valsalva*, liv. 8.

CASE 6.

Punctured wound of the stomach, diaphragm, and lungs.

A young man, twenty-five years of age, received two wounds with a sword, one about four digits below the ensiform cartilage, on the left side; and the other a little below the left hypochondrium. At both wounds the omentum protruded. On attempting to lie down he experienced a sense of suffocation, and consequently was unable to breathe except with his neck erect. He vomited; and, at the expiration of thirteen hours, died.

Dissection. The lower wound had not injured the viscera, but the upper had penetrated the stomach, the diaphragm, and lungs. Blood was extravasated into the thorax as well as the abdomen; and the cavity of the stomach was also filled with blood.

Valsalva, liv. 10.

Punctured wounds of the mesentery.

Ruysch, in his *Thesauri Anatomici*, reminds us that throughout the mesentery a considerable number of nerves are distinctly visible, the injuries of which produce extremely violent symptoms, and very great pain: and, in his *Adversaria*, he asserts that he had often seen men die within two or three days, after continual and intolerable pain in the belly had been experienced, though he could discover lesion in no important part except the mesentery. The following instance, related to me by a surgeon of undoubted veracity, tends to confirm his observations, although, indeed, the intestine was slightly wounded,

as well as the mesentery; and life was protracted longer than Ruysch had observed.

Morgagni, liv. 34.

CASE 7.

A foreigner received a wound from a thin two-edged sword which penetrated the abdomen obliquely, on the left side, beneath the ribs. The narrowness and obliquity of the wound were such that even a probe could not be introduced. From the time of receiving the wound till the fifth day, (on which he died,) he vomited bile, with the ingesta. He was tortured with pains in the belly, and the intestines never acted except by means of stimulating clysters. Towards the close of life blood escaped from the mouth and nostrils.

Dissection. The intestines were distended with gas, and beneath them a small quantity of blood was extravasated. The sword had reached to the intestinum colon, about four digits below the spleen; but it had injured it only superficially. The weapon then passed onward and wounded the mesentery, which was also found swollen.—*Morgagni*, liv. 35.

In judging of the seat of wounds in the viscera before death, the influence of the ascent and descent of the diaphragm, in changing their position, must not be forgotten.—36.

From violent contusions the viscera of the abdomen are sometimes ruptured when the external parts remain uninjured.

CASE 8.

Laceration of the omentum, and of the intestinum ileum.

A man, thirty-five years of age, was kicked on the abdomen by a horse. He experienced severe pain, and vomited; and was received into the hospital of

St. Mary de Vita. A sensation of weight at the lower part of the abdomen came on, accompanied with difficulty of breathing; and under these circumstances he died.

Dissection. There was no appearance of bruise in the abdominal muscles which corresponded with the organic injury. The abdomen contained a large quantity of extravasated blood, which had issued from a rupture of vessels in the omentum; and the intestinum ileum, lying beneath the omentum, was completely torn asunder, almost transversely. The lungs were greatly inflamed.—*Valsalva*, liv. 14.

The spleen has many times been found ruptured from blows and falls. Indeed, from the softness of its texture, and the thinness of its coats, laceration is more likely to occur in this viscus than in any other. Whenever this accident happens, a great quantity of blood is rapidly effused, and fatal consequences speedily ensue. Notwithstanding the firm texture of the kidneys, they also have been ruptured by violent percussion; and the same injury has happened to the bladder.

The liver has been burst by the kick of a horse, and other forcible blows. Platner gives an example in which several fissures were made in this viscus though not very deeply. The patient survived four days, and the abdomen was filled, not with blood, but with bloody lymph. When this organ has been so lacerated that the effusion of blood has been considerable, death has resulted more speedily. In no viscus of the belly are deep wounds more certainly or more speedily mortal than in this.

From various causes the gall-bladder has been ruptured, and bile effused into the abdominal cavity, as I have shown in the *Epistolæ Anatomicæ*. The symptoms which arise from the effusion are sometimes severe and fatal; but it has been doubted whe-

ther the effusion of bile of itself produces dangerous consequences. Certainly the danger is not equal to that which results from the effusion of urine into the abdominal cavity.—38.

A boy who fell from the shafts of a cart, was squeezed between the axle and wheel, and died ten hours afterwards. Besides sugillatio of the intestines, there was rupture of the pylorus, the liver, the vena portæ, and right kidney; and the belly was full of extravasated blood. It is somewhat extraordinary that the patient should so long have survived this extensive injury.—17.

From violent blows, or a wheel passing over the abdomen, the intestines have been ruptured in other instances besides that which occurred to Valsalva, and which is related above; and this injury is peculiarly liable to happen if the stroke is given when the intestines are distended.*—15.

* Dr. Swammerdam has related an instance of rupture of the mesentery, which occasioned volvulus, and proved fatal.

Phil. Trans. vol. i. anno 1675.—*Ed.*

CHAPTER IV.

DISEASES OF THE URINARY AND GENITAL ORGANS.

SECTION I.

DISEASES OF THE KIDNEYS.

CASE 1.

Suppuration in the kidney, producing gastric disorder.

ONE of my former colleagues, sixty years of age, and a man of considerable distinction, was attacked with vomiting, and though he sometimes had a day's immunity, the retching was frequent and troublesome; but nothing uncommon was observable in what he ejected. He was attended by three physicians who entertained no doubt that the cause was seated in the stomach, but all the measures employed with a view to remove the disease were unavailing. The patient became increasingly emaciated and retired into the country; but deriving no advantage from the change, he returned into town. After his return he was seized with extreme coldness over the body, and that night voided a great quantity of blood with his urine, and soon afterwards an excessive quantity of pus. The urine he voided was alternately bloody and purulent, his strength failed, and he died within a few days.

It is easy to perceive that the cause of the vomiting was not seated in the stomach, but in those organs which are subservient to the secretion of urine, especially the kidneys, which readily draw the stomach into sympathetic action, and excite vomiting. In addition to the symptoms which have been premised, the patient from the beginning complained of pain in his legs; and the stimulus to micturition was so urgent, that he could scarcely retain his urine till he took the chamber utensil in his hand; indeed, sometimes he was unable to retain it: and these symptoms were elucidated by the sequel. There was also a degree of hardness about the epiploic region, and although the patient did not generally complain of pain in the loins, the combination of these symptoms, especially when conjoined with the inutility of measures directed to the stomach, might have excited an idea that the kidneys were diseased, especially the right.

Some weight would have been added to this opinion, had an inquiry been made respecting the diseases to which the ancestors of this patient had been liable, for it would then have been discovered that diseases of the kidney had been very common in this illustrious family. In cases where the causes of disease are obscure and uncertain, and where the disease obstinately resists the treatment employed for its removal, the probability of an hereditary disease should be investigated.—*Morgagni*, xxx. 22.

Diseases in the kidneys may sometimes excite severe and even fatal uneasiness in the hypochondria, when the viscera naturally situated in those regions are free from disease. Of this circumstance the following case affords an example.

Morgagni, xxxvi. 19.

CASE 2.

Enlargement and suppuration of the kidneys.

A maiden was seized with excessive vomiting accompanied with fever. The former was allayed but not the latter. Violent pain beneath the spurious ribs came on, and she was carried off by the disease in two days.

Dissection. The abdomen contained some limpid serum, and the stomach and intestines were inflated. Each kidney was three times larger than its ordinary magnitude; and between the proper coat of the left kidney, and the substance of that organ, a small quantity of pus had been formed.

There was a little serous fluid in the cavity of the thorax, and the pericardium was full of a similar liquid.—*Valsalva*, xxxvi. 20.

Augmentation of bulk in the left kidney, accompanied with disease in its structure, has more than once occasioned a tumour or pain in the corresponding hypochondrium. This fact is demonstrated by cases in the *Sepulchretum*. In reference to one of them *Ballonius* says, *non credebant dolorem esse nephriticum, et tamen erat. At situs doloris, et partis decipiebat.* This may sometimes happen on the right side also. *Bonfligius* relates an instance in which a tumour was at first perceived in the right hypochondrium, but after long continuance and progressive increase, it left that situation. I have no doubt it was the kidney, which was found in the iliac region, enlarged to five times its usual size.—*Morgagni*, 21.

CASE 3.

Ulceration of the kidneys.

A knight, forty-six years of age, who formerly had been corpulent but had now become slender, and had a pale sallow complexion, experienced many disagreeable symptoms in consequence of numerous acts of indiscretion in diet, exercise, mental exertion, night studies, and venery. He had twice contracted gonorrhœa and been affected severely; he suffered pain in the stomach, accompanied with vomiting, and by this means he sometimes ejected veal unchanged, which he had eaten five days before. The measures adopted relieved all these complaints, when he a third time became tainted with gonorrhœa, and had spasmodic pains in making water, and continued watchfulness. During this attack tumours arose at the extremity of the rectum, and for some months five or six ounces of blood were discharged from them every day. Under this protracted hæmorrhage the patient was reduced to such extreme weakness that an attempt to walk produced syncope. In addition to the continued loss of blood he was troubled with diarrhœa, which, though varying in degree, continued to the day of his death; and the appearance of a purulent sediment in the urine was of the same duration. His urine almost always escaped from him involuntarily, and the frequent discharges were attended with pain; but if the urine was retained in the bladder for a short time longer than usual, its expulsion excited the most excruciating agony, in consequence of the tenacious quality of the matter.

During several years he was distressed with these affections, his pulse being always quick, frequent, and turgid; though the other symptoms which indi-

cate fever were absent. About forty days before his death he lost a considerable sum of money by gaming, and this event deeply distressed his mind, and disordered his body. He retired to bed with vomiting and fever, which commenced with slight shivering, and a heavy pain in his head. The quantity of sediment in his urine increased, and the pain in voiding it becoming progressively more severe, excited singultus. At the expiration of some days this symptom was allayed, but pustules arose upon his lips, and probably about the fauces also, as he suffered acute pain in that part, accompanied with a difficulty in swallowing, and with the ejection of a viscid and tenacious sputum. For two years before the fatal termination he had perceived slight itching in the skin of the loins, and, at times, within some weeks before death, it was exceedingly tormenting. In process of time the singultus returned; the patient's strength daily decreased; and he died convulsed, when about eight years had elapsed from the time at which the disorders referred to commenced.

Dissection. With the exception of containing some small stony concretions, which scarcely deserved notice, the lungs were sound.

The kidneys appeared to be less than their natural size, and were of an unusual figure, in consequence of having many protuberances exteriorly: and when these parts were cut into they were found to contain pus, and opened into the pelvis of the kidney. However, in the urinary bladder, and especially about its cervix, where the foundation of the disease was unanimously supposed to exist, nothing worthy of observation appeared, except slight abrasion around the orifices of the ureters.—*Valsalva*, xlii. 2.

Valsalva justly supposed that this dissection inculcated a lesson of some importance, tending to make

us cautious in determining the seat of diseases in the urinary organs; for the diagnosis of these diseases even when sought with the utmost skill and attention, is frequently deceitful.—*Morgagni*, 3.

I am indebted to Santorini for the following case.

CASE 4.

Extenuation of the kidneys.

A pregnant woman, who had laboured under diseases of the kidneys, died in the fifth month of uterogestation.

Dissection. One of the kidneys was meager, for although the pelvis was considerably dilated, the substance of the kidney itself was greatly diminished in thickness. The other kidney was elongated and widened, yet, in some parts, the substance of this organ was of very inconsiderable thickness, and its pelvis was extremely dilated. The ureter in which this pelvis terminated was so narrow that it was scarcely possible to force air through it. Where the pelvis was united with the inner structure of the kidney, it was pierced with wide foramina which communicated with large cells. One of these cells also had its parietes perforated with other orifices, into which the air being driven, distended a great number of the small canals and the emulgent artery at the same time. The cells were filled with urine, but the surface of the kidney was made up of blood-vessels compacted into a kind of thick stratum.

Morgagni, xl. 18.

Willis has described the case of a matron, who, for many years, had been subject to spasmodic affections, which were more especially troublesome to her during pregnancy, in consequence of which she always miscarried about the end of the third month

This circumstance had recently happened, and the violent pains, especially in the loins, which had preceded abortion, frequently recurred afterwards, and were accompanied with vomiting, which continued till nearly the day of her decease—an event which occurred on the twenty-fifth day after miscarriage. On inspection after death, water was found within the cranium; and although the kidneys appeared sound in their texture, one of them was of an unusual figure, being lobulated like the kidney of a calf. After intolerable pains of the loins had been experienced, and when every one expected that calculi would be discovered in the kidneys, Ruysch found merely that these organs had an uneven surface, as in the human fœtus, in calves, and in oxen.—19.

Sometimes this lobulated appearance of the kidneys may be natural, especially in youths; and we cannot be surprised if, sometimes, these organs lose the unevenness of surface, which is natural to children, at a somewhat later period than usual; but when it occurs in adults I believe that it will usually be found accompanied with disease in the urinary canals. Under these circumstances Ruysch found the upper part of the ureter dilated; Spicilegium observed the pelvis and ureter greatly expanded; and others, as well as myself, have found disease in the bladder, or in some other part of the urinary system.—20.

CASE 5.

Unevenness of surface in the kidneys.

The head and some of the viscera of a woman, who died in this hospital, were brought to the college at the time I was teaching anatomy in the year 1726.

Dissection. The medullary substance of the cere-

brum was brown, and exhibited numerous bloody points; the lateral ventricles contained a little water, and the cerebellum was extremely soft.

In the thorax and abdomen there was an accumulation of fetid serum. The larger orifice of each Fallopian tube was closed in consequence of the extremities of the tubes adhering firmly to the ovaria. Both the kidneys were uneven on their surface, and the subsided parts were variegated with white spots, so that we could easily perceive that the inequality was unnatural. The inner surface of the urinary bladder was reddened.—*Morgagni*, xl. 21.

CASE 6.

Kidneys small and uneven ; ossification of the splenic artery ; hydrocele.

About the end of the year 1742, I demonstrated to the students some parts of an old man's body, and the following were the morbid appearances.

Dissection. The tunica vaginalis of one of the testes contained turbid fluid, and a prominent roundish body arose from the albuginea. The aorta, at its bifurcation, was ossified, and the splenic artery, from its commencement to its entrance into the spleen, was considerably dilated and consisted almost wholly of bone. The gall-bladder was small; and, in proportion to the size of the man's body, the kidneys were small, and their surface was uneven, but their texture appeared healthy. The urinary bladder was large and its parietes greatly thickened, as they usually are in persons who have been afflicted with difficulty in voiding urine from calculi or from any other cause.—*Morgagni*, xl. 22.

CASE 7.

*Kidneys small and uneven ; aneurism of the heart ;
hydatid on the liver ; diseased bladder.*

Another old man, exceedingly indigent, who had obtained a miserable subsistence by eating the rinds of melons which were thrown into the streets, or any thing else of that nature, came into the hospital afflicted with difficulty of respiration, accompanied with cough, a feeble pulse, and fever. Obtaining some relief, he went out of the hospital, but some time afterwards he returned, so emaciated and broken down by disease, cold, and hunger, that he died soon after his admission.

Dissection. The thorax and pericardium contained a redundance of serous fluid ; the lungs were firmly united to the sides and back, and when the right lung was drawn away it left an adventitious membrane, which was thick and opaque as well as firm, adhering to the parietes of the thorax. The lungs themselves were not perfectly sound, and something hard was perceived in the upper part of one of the lobes. The heart was enlarged to twice its natural magnitude. Both ventricles were dilated, but whilst the parietes of the right ventricle and auricle were exceedingly thin, those of the left cavities were thicker and firmer than natural. The mitral valves were enlarged, and very thick, and on their lower borders, tuberoses. The semilunar were less flexible than usual, and one of them at the inferior part was ossified.

The aorta, before it arrived at the curvature, was dilated, and its inner surface exhibited whitish spots, some of which were very hard and bony. This was most remarkable at the origin of one of the lower intercostal arteries, the orifice of which was in the centre of the spot, which protuberated

in the circumference, contracting the opening, and, at first sight, it resembled a large lenticular gland. The iliac arteries were tortuous, and the veins appeared to be corrugated.

The stomach, though containing but little, was large, destitute of rugæ, and internally of a brown colour. The whole of the convex surface of the liver, with the exception of a small space on the right side and at the lower part, adhered firmly to the diaphragm; but in this upper surface the substance of the liver was excavated by an hydatid the diameter of which was equal to a finger's breadth. In one place on the convex surface of the spleen, the capsule was opaque, and in the centre of this opacity, ossification had taken place to a small extent. The spleen itself was somewhat enlarged and flabby, and its artery appeared wider than the enlarged bulk of the viscus would explain. Many of the mesenteric glands were as large as beans, but they appeared exempt from disease.

The kidneys were small in proportion to the size of the body, and their posterior surface was as convex as the anterior. Both of them were uneven, and in some degree tuberoso, especially the left; in which, also, there were depressions which appeared as if they had arisen from cicatrices. The orifices of the ureters within the bladder were wider than ordinary, the vessels of the bladder were as turgid as if they had been injected with wax, and, externally, this viscus was furnished with fibres which were redder than they generally appear.

Morgagni, xl. 23.

CASE 8.

Kidneys uneven ; tubuli enlarged ; congestion of blood in the vessels of the bladder.

A rustic old woman. of a small stature and ex-

cessively thin, who had previously laboured under dyspnœa, died after two days increased indisposition; and it was supposed that her death is to be attributed rather to her advanced age than to disease. I examined only the abdominal viscera.

Dissection. The aorta from the diaphragm to the iliacs was universally uneven from yellow bony lamellæ, and was besmeared with a thickish and unpleasant secretion, of a brownish and bloody colour. It adhered to the inner coat, from which, when broken through and ulcerated, it had distilled between the circumjacent laminæ. This morbid condition extended into the cœliac artery, and was propagated also into the splenic, the coats of which were dilated and thickened, and not free from ossification. The trunk of the hepatic duct was larger than it generally is. The uterus had an extremely narrow cavity, though the woman had borne children.

Both the kidneys had nearly as uneven a surface as they have in the fœtus; and not only was there a prominence of the pelvis, and of two other large tubes which are united with it, but also, many tubuli of a smaller size, which communicated with one or the other of the larger ones, were also unusually distinct on the surface. All these tubes were larger than they usually are, and also the ureters, especially the tubuli and ureter of the right kidney; although this organ was considerably smaller than the left. The inner surface of the bladder was unusually vascular; the small tumid blood-vessels were of a blackish colour—indeed, the whole of the lower part of this viscus was black to a considerable degree.—*Morgagni*, xl. 24.

To these cases I might add the instance of the ostler already related.*

* See vol. i. p. 56.

With respect to the cause of this appearance, we may observe that if, besides the exterior protuberance, we admit the existence of disease internally, or upon the surface, it will assist us in conjecturing the cause of the inequality, as well as of the pains and of the bloody urine. In most of the preceding cases, traces of disease may be discovered by attentive inspection. If on the surface of the kidneys there had existed many of those cysts which have been described, when writing on the subject of hydatids, the serum contained in which may sometimes be of an acrid quality, not only may the kidney itself be irritated but some blood-vessels may be ulcerated. From these circumstances, also, a discharge of bloody urine, and pain, would arise; and the pain might be aggravated by the quantity of serum distending and overloading the part. When this serous fluid is dispersed I have shown that cicatrized spots and depressions remain, and the uninjured substance of the kidney, being here and there prominent, will render the surface rugged, as if from tubera. I suggest this opinion concerning the origin of the appearance in question rather with a view to lead to the invention of a better hypothesis.—25.

CASE 9.

Hydatids in the substance of the kidneys, and in the ureters; retention of urine from an enlarged prostate; cerebrum indurated, cerebellum softened.

A man, sixty years of age, had been in this hospital, for some months, in consequence of a serous infarction of the left thigh and knee, and when this affection had been removed his departure was delayed first by an attack of dysentery, afterwards by ophthalmia. Indeed, when these successive attacks had been overcome, he was kept in the hospital on

account of his extreme indigence, which was proportionately increased by his having an insatiable appetite. In the middle of December 1749 he died suddenly whilst eating, without syncope or any sense of suffocation, nor had he indeed complained of any affection of the head or chest; but the persons who had been about him had sometimes heard him complain of his urine being acrid.

Dissection. The vessels of the dura mater, on the left hemisphere of the cerebrum, were turgid with blood, and the corresponding lateral ventricle contained a somewhat turbid serous fluid. The quantity was not very great, but there was considerably more than on the right side. The medullary substance of the cerebrum was rather hard, but that of the cerebellum was extremely flaccid.

The posterior surface of the left lung adhered closely to the costal pleura, and the edges both of this and of the right lobe exhibited their vesicles greatly distended with air. The pericardium contained a little turbid water.

The liver and stomach appeared somewhat larger than usual. The trunk of the aorta, where it passed along the lumbar vertebræ, and some of the branches, exhibited white spots; and, in some parts, ossification had taken place. The right testicle was three times larger than the left, but the texture of both was healthy, and perhaps the difference of size was natural to him. From the tunica albuginea of both testes, a somewhat round and very small body was pendulous, which I supposed to be the remains of an hydatid; however, there was no fluid within the tunica vaginalis.

The interior structure of both kidneys appeared to be confused, and they contained some small cells full of fluid, one of which showed itself partly on the surface. Each pelvis was two digits in diameter, and

the middle of both the ureters was dilated, especially the left, which was elongated in consequence of its flexures. On feeling the ureter, the sensation of there being calculi in some parts of them was communicated, but when they were slit open, an hydatid was found in every one of those places. Some of them were round, others oval, hanging from the inner coat into the canal of the ureter, but not by a small stalk. The round ones were equal in size to very small grapes, and the oval hydatids were double the length of the others. The coats of the ureters were thick, the inner was uniformly reddened, and they opened into the bladder by orifices more oblong than usual.

The bladder contained so large a quantity of urine that, in the supine position, this reservoir extended to the lower vertebræ of the loins. When the water was discharged, and the bladder inflated, it was found to be considerably longer than it generally is, but the coats were neither red nor thickened. From the posterior border of the orifice, whence the urethra commences, two small prominences arose: they were white, hard, and hemispherical, contiguous to each other, and protuberated within the bladder. On dividing them longitudinally, with the prostate gland, I found that they were continuous with it, and constituted of the same substance; nor was the greater part of the substance of the gland softer than of the prominences.*—*Morgagni*, xlii. 11.

* The cysts which form in the kidneys sometimes acquire an enormous size. Mr. Jackson has related an instance in which the kidney resembled a large bullock's heart in its shape and appearance; the veins on the surface being very similar to the coronary vessels of that organ. It extended from the thorax to the thigh, and contained about two gallons of fluid of a dark colour, and not of a uniform consistence. The odour resembled that of blood which has been extravasated some days; and the

This man's sudden death I ascribed to the state of the head. The hydatids appear to have produced affections similar to those which calculi would have occasioned, and it is not surprising that urine more acrid than usual should have been secreted from kidneys diseased as these were ; or that instead of a humour being secreted by the glands, suitable to defend the ureters against the saline particles of the urine, an acrid secretion should be deposited. From either cause we may account for the redness of these passages.—12.

mass had an unctuous and adhesive feel. The cyst was a quarter of an inch in thickness.—*Med. and Ph. Journal*, Jan. 1816.

Mr. Johnson has described a case which was supposed to be an accumulation of fluid in the pelvis of the kidney. The patient was a female, and the distention commenced after she had become pregnant, so that the abdomen felt as if there were two uteri. Subsequent to parturition the abdomen subsided but little, and she appeared to labour under ovarian dropsy. Nine days after delivery an immense discharge of fluid, of a milky colour, took place, whilst the patient was asleep ; and five days afterwards she died. The ureter, in some places, was as large as the iliac artery ; and the immense bag from which the fluid had descended, was supposed to be the capsule of the kidney, distended to an almost unexampled extent. About three pints of fluid, the same as that which had escaped, remained in the bag. Its parietes varied in thickness from that of a penny piece to that of a shilling. The internal surface was highly vascular, and was studded with mamillary or papillary bodies, varying in size from that of a pin's head to that of a small pea. It was supposed to have contained, at first, five or six quarts. There was no appearance of hydatids.—*Med. Chir. Journal*, July, 1816.

The cysts cannot strictly be regarded as the organized simple animal which constitutes the true hydatid ; which, however, has been found in this organ. Dr. Baillie describes an instance in which they were included in an obscurely laminated bag, of a cartilaginous hardness. In sheep, hydatids of the kidneys have been found invested with a kind of osseous incrustation.—*Ed.*

CASE 10.

Calculi in the kidneys, attendant upon gout.

A priest, fifty years of age, having been for many years subject to arthritic pains, especially in the fingers, was at length seized with nephritic pains also. He had frequent vomiting of bilious matter, and once he threw up blood, which often flowed from the nostrils. His urine, from being small in quantity and aqueous, began to be voided in a larger quantity, with a mucilaginous and opaque matter. Suddenly the whole body became convulsed, and by a recurrence of this affection, more violent than the first seizure, he was carried off.

Dissection. All the intestines inclined to a livid hue. The stomach was healthy, and there was no trace of the part from which the blood had issued. There were several very small calculi in the kidneys, some of which were black and others white; and there also were sinuses full of urine, especially in the right, the pelvis and continuous ureter of which were greatly dilated by the urine.

The internal substance of the brain, in some measure, abounded with serum, but in the ventricles it was in great excess. At the joints of the fingers, when the cutis was taken off, calcareous matter, of a yellowish white colour, was found in the theca of the tendons.—*Valsalva*, xl. 2.

It often happens that nephritic pains follow painful affections of the joints; and, in process of time, after the renal disease, violent affections of the head supervene. When a calculus has formed in the kidney, it is frequently surrounded by the mucus with which the pelvis and tubuli are smeared over to defend them against the acrimony of the urine. This humour being increased in quantity, from the irrita-

tion of the calculus, and having become thicker, diminishes the urgency of irritation as long as it adheres to the calculus and interposes between the asperities of its surface and the irritable lining of the kidney. When this mucilaginous secretion has been removed by medicines improperly administered to augment the quantity of urinary discharge, or from any other cause, the irritation will necessarily be more violent.—*Morgagni*, 3.

CASE 11.

Renal calculus; one kidney wasted, the other enlarged.

The woman to whom the following particulars refer died in the hospital at Padua, in March 1708, when she was in the seventh month of pregnancy.

Dissection. The abdomen and uterus were immediately opened, and the foetus was taken out alive, although it died soon afterwards. I removed the kidneys, and found that the left was larger than might have been expected from the size of the woman, and its small canals were wider than usual. On the contrary, the right kidney was so exceedingly lessened as not to exceed the magnitude of the ren succenturiatus, and the diameter of the renal vessels and ureter corresponded with it. The tubuli were contracted, and the remaining substance was reduced almost to nothing, so that when a calculus and some calcareous matter, which were contained within it, had been removed, the kidney was nearly annihilated.—*Morgagni*, xl. 12.

A contrariety of opinion has existed as to the greater frequency of ulceration and calculi in the right or left kidney; and probably these lesions have most frequently occurred in the left; but not

unfrequently both these organs are diseased simultaneously.

Du Verney relates a case in which there had been purulent discharge by stool, and the pus was found to have flowed from the kidney, in consequence of its adhesion to the colon, and of ulceration having taken place; so that the kidney and intestine communicated with each other.—13.

In Bonifacio Corneo, Eustachius found one kidney not larger than a chestnut, whilst the other exceeded its natural size. The texture of the former he considered healthy, but the latter was in a state of suppuration, and turgid with calculi and pus. Valcarengus found one of the kidneys equal to ten times its usual size; and in the History of the Royal Academy of Sciences at Paris a case is related in which the kidney weighed thirty-five pounds—indeed Monginotius met with an instance in which it was upwards of double that weight. On the contrary, I suspect that the kidney has sometimes been so attenuated and contracted from calculi and other lesions, as to induce a suspicion that the organ had been deficient from birth. The ureter has been discovered in its natural situation, though there was no kidney. The residue has many times been found to be merely a kind of involucrum resembling a purse or bag, in which cases I suppose the substance of the kidney had been destroyed, and its membranes only remained. I should suppose the kidney to have been originally deficient in those persons in whom no disorder of the kidneys had preceded death, and where there was no vestige of emulgent vessels or ureter; and where there has been a deficiency of one kidney, the other has been found to possess a double pelvis, and two ureters. In 1702, however, I found a ureter, indeed, but it was solid. One extremity was connected with the bladder, and the other was united

to a body of fat, which in form and bulk resembled the kidney.—14.

In the case which led to these observations, I suppose that the magnitude of the sound kidney was increased by the diminished bulk of the one diseased. It often happens that when one of the kidneys ceases to secrete, or does not emit the urine that is secreted, in consequence of ulceration, or of an obstructing calculus, the deficiency is supplied by the other.

Among the histories of Guy Patin and Bartholin it is related that an angular calculus occupied the kidney though no pain had been experienced in that part; and cases are recorded in the *Sepulchretum* and in other writings, in which, not only had renal calculi been unaccompanied with pain, but there had existed none of the numerous symptoms which usually indicate their existence.

The reasons why one symptom only may arise, and sometimes none, may be various. When these concretions, though of a considerable size, are perforated like a ring, a suppression of urine does not happen. If the calculi increase gradually and slowly, and have no sharp angles—if they adhere closely to the kidney—or if the kidney has become callous, there will be no annoying sensation in the loins. It is superfluous to intimate that causes may arise from which the pain in the kidneys, which had previously been acute, may cease. This, however, might happen in consequence of small nervous branches having lost their sensibility, or been destroyed, and it shows how important it is to inquire into the preceding symptoms. And if, at any time, no characteristic indication of a renal calculus should appear, we must not despise those which are of slighter importance, or which are common to this and other diseases. On several occasions I have found calculi in

the kidneys, which had not discovered themselves by pain in the loins.—15.

The following observations show that the symptoms attendant upon renal calculi, and other diseases of the kidneys, are sometimes deceitful.

CASE 12.

Calculi in the kidneys.

A person who was afflicted with some disease of the parts subservient to the secretion of urine, complained of very little uneasiness in his kidneys, or in the region of those viscera, but he was tormented with pains in the bladder, so excruciating, that five or six physicians entertained no doubt that the seat of disease was in that organ.

Dissection. No morbid appearance whatever was discovered in the bladder, but there were large and ramifying calculi in the kidneys. These calculi I have seen, as they were preserved by Valsalva.

Morgagni, xlii. 4.

A boy whose case is mentioned in the *Sepulchretum*, manifested by his gestures that he suffered most violent pain in making water; yet we do not read that any symptoms of pain in the kidneys were observed. After death nothing unnatural was found in the bladder, but in the *carunculæ papillares* of one kidney there were sandy particles, and at the beginning of the ureter there was an extremely hard calculus.

Therefore, whether irritation be propagated from the kidneys to the bladder by the continued membranes of the ureter, which is the most sensible where it terminates; or whether small particles of sand, or acrid particles of matter, descend into the bladder, which is most probable, the coats of this viscus are irritated, and the most severe pains excited, especially when it contracts to expel the urine. In

a man attended by Hottinger, a very acrid matter flowing from ulcerated kidneys into the bladder, had so affected this reservoir and the neighbouring parts, that whilst there was only occasional pain in the loins, the pain in the bladder was constant and attended with all the symptoms of vesical calculus. From these circumstances Hottinger entertained no doubt that a calculus existed in the bladder of this man, but no trace of one was found after death.

Bonfiglius has related the case of a matron who had been affected with dysuria from infancy. The urine sometimes presented a milky appearance, and towards the last, foliated membranes were discharged with it, accompanied with the sensation of a very heavy weight, and with pain and ardour. No disease was found in the bladder, but one of the kidneys was diseased internally, and was prolapsed in consequence of its enlargement.—5.

It has been attempted to distinguish renal calculi from those of the bladder by their colour, but this effort has been founded on too small a number of observations, or upon some opinion formed without examination. It is certain that the calculous deposition may form different combinations in the bladder by which it may be tinged red, yellow, black, or with any other colour. From this diversity of mixture arises the facility or the difficulty of solution of different calculi, and no hope can be entertained that any remedy will be discovered by which they may be dissolved with equal readiness. Calculi have been known to attain the weight of five pounds, and wherever their removal is impracticable, it is desirable to allay irritation, which cannot always be effected by the same medicine, even in the same individual. Valsalva noticed this fact more than once, and in a maiden of rank, who for two years was afflicted with pains in the kidneys, he was compelled to vary his

remedies every paroxysm, for those which had given immediate relief before, were resorted to again without effect.—*Morgagni*, xl. 16.

Among other evils which often result from nephritic pains in women, I do not doubt that abortion, and even the death of the mother, as well as that of the foetus, may be enumerated. For as the enlarging uterus, by compressing the ureters, renders the transmission of urine through them less free, and consequently delays it in the kidneys, it is natural to suppose that if this organ had previously been in a diseased state, the inner membrane will be increasingly irritated and pain excited. We may suppose too that the whole body, but especially the parts contained in the abdomen, sympathizing with the affection of the kidney, uterine action may easily be induced, and the foetus be extruded prematurely. The foetus and the mother, who are frequently unable to conflict with violent diseases, may suffer so much as to render it impossible for either of them to escape death. Platerus has related the case of a woman who had been pregnant fourteen times, but who uniformly miscarried in the eighth or ninth month. She had been afflicted with most violent pain in the loins, and after death one kidney was found reduced into the form of a purse by the wasting of its substance, and the other was very tumid in consequence of being occupied by a large calculus. In the case introductory to these remarks, I have reason to believe that pain in the kidneys had been one of the causes of death, and suspect that the same consequence ensued in the previous case of extenuation of the kidney.—17.

CASE 13.

Calculus formed in the kidney but voided ; retention of urine ; muscular fibres of the bladder enlarged.

A very fat man, sixty years of age, who at an early period of life had experienced great difficulty in making water, at length was afflicted with complete retention, accompanied with violent pain in the loins, but without any vomiting. Daily he had an accession of fever, and the shivering and coldness lasted for two hours. On the catheter being introduced he discharged some bloody matter, and with it a calculus the size of a small almond. This was succeeded by purulent urine, but the urine afterwards became clear like that of healthy persons, though it was not entirely destitute of fœtor, and the pain in the loins continued. An apparent remission in the disease had occurred, when, in the fifth night, the patient was seized with a kind of epileptic paroxysms, attended with bloody foam at the mouth, and under these circumstances he died.

Dissection. When the abdomen was opened the bladder appeared to be full of urine, the quality of which was natural, except that it had a very offensive odour. The fleshy fibres of the bladder were greatly thickened, so as to resemble the bundles of muscular columns in the heart. Some grains of sand were found about the cervix, but no obstacle was discovered in the bladder by which the discharge of urine could have been prevented. The ureters and kidneys were in a perfectly healthy state.—*Valsalva*, xl. 4.

Whatever had formerly been the cause of the difficulty in making water, it is probable that the

augmented thickness of the fibres of the bladder had arisen from that circumstance, as will be demonstrated on a future occasion. The final disease, which related to the urinary organs, seems to have been the effect of the calculus. This would be the more readily generated in one of the kidneys of a man whose corpulency threw an impediment in the way of exercise. It frequently happens that when one kidney is diseased, the other becomes sympathetically affected; and if a calculus has escaped from the ureter, and has been urged into the lower orifice of the bladder, the pain in the loins may still continue, from the same cause that pain in the kidneys is sometimes propagated towards the bladder, namely, through the medium of the ureters; and when the bladder is so distended that it can admit no more urine, the ureters themselves become dilated with it.

We are not informed that there was any examination of the brain; but, it is probable that serum had been deposited there, and proved the cause of the epilepsy and of death.—*Morgagni*, 5.

It is unquestionable that *worms* have been found in the kidneys of dogs and of other animals, and are reported to have been found in the kidneys of the human subject, but the instances of the latter are not very satisfactory. If they do exist, the symptoms would probably resemble those which attend calculi.—6. 8.

Solitary kidney.

The examples of but one kidney being found in the body are numerous. Sometimes it occupies its natural situation, at others it is situated on the spine; and it has been observed of a considerable bulk. The kidney has been found with two pelves,

and two ureters. It has not always exceeded the natural size; and cases may arise where there are two kidneys, and yet only one enlarges. A solitary kidney has sometimes been found having the shape of a cornuted moon, being a conjunction of the two kidneys, occupying their usual places, and meeting across the back. The cornua have sometimes been upwards, and, at others, downwards.

In the year 1740, I found a solitary kidney in the body of a girl six years old. It differed from most others in the circumstance that there was but a short interval between the right and left lobes; the former, indeed, at the lower part, was laid upon the latter, and divided by a sulcus, which was not very deep and only on its anterior surface. Therefore an isthmus was formed which was not more slender than either lobe. The isthmus connecting the two kidneys generally is slender. So far as I know, Francus is the only person who saw and delineated an isthmus—*maxima vastitate, et amplitudine*.

In the observations of Piccolhominus, a bad habit of body was ascribed to the isthmus having compressed the vena cava and aorta, and deranged their functions; and Azzariti attributed an aneurism of the aorta, which had arisen between the appendages of the diaphragm, to the same cause. In general, however, the isthmus, being slender, cannot occasion any serious mischief.

In the body of the girl in whom I found an isthmus not smaller than either lobe, and the lobes not very distant from each other, (for instead of occupying their usual situations, they lay upon the sides of the vertebræ,) I observed that the abdomen was not prominent, nor did the ribs deviate from their usual appearance as some have supposed they do in such cases. However, when the bulk of the kidney is considerable, and, at the same time, is prominent

upon the naturally projecting vertebræ, the abdomen must necessarily project; and when a female has been the subject of this unnatural appearance, it has occasionally excited a suspicion of pregnancy. But whilst the woman is living, and may be interrogated, and when she reports that the tumour has existed from birth, we cannot be misled. We may, however, be deceived when one of the kidneys becomes greatly enlarged from disease, and descends into the hypogastrium.*—*Morgagni*, xlviii. 16.

In the following case the pain in the loins arose from a cause exterior to the kidney.

Abscess in the iliac region.

A maiden about twenty-four years of age, having fallen from an eminence, was seized with an oppressive pain in her loins, accompanied with fever. Both these symptoms were mitigated, but they became violent again at the expiration of some days, and were conjoined with a sense of weight in the

* The kidney has sometimes been found greatly enlarged and totally deprived of its natural organization. In the *Philosophical Trans.* a case is mentioned in which this organ weighed five pounds, and its texture resembled that of a scirrhus or boiled liver. It also contained two cells filled with coagulated blood.

Phil. Trans. abridged, vol. 4.

An instance occurred to Dr. Palloni, in which the disorganization presented a fungous or pulpy character. The structure of the kidneys was so completely changed that their ordinary figure, colour, and consistence, were no longer cognizable. They were converted into a whitish pulp, in the middle of which some calculi were found. This affection was complicated with general visceral disease.

Med. Chir. Journal, Sept. 1816.

Nephrotomy was successfully performed on one occasion by Dominic de Marchetti, a celebrated and experienced practitioner at Padua. Three calculi were removed from the kidney on this occasion.—*Phil. Trans. abridged*, vol. 4.—Ed.

cavity of the abdomen, and with vomiting of matter which sometimes was green, and at others blackish; and similar matter was discharged per anum. Under these circumstances she died.

Dissection. As soon as the abdomen was opened, pus began to issue from that cavity, and on its being collected together with sponges, it weighed about eight pounds. The intestines adhered to each other, but notwithstanding this adhesion, some rather thick pus occupied their interstices. The mucous coat of the intestines was healthy; the liver was of a whitish colour, and purulent matter, of a rather thick consistence, adhered to its surface. On the left side, towards the iliac region, the omentum was attached to the peritoneum, and in that part an ulcer existed.—*Valsalva*, xl. 9.

The large quantity of purulent fluid discovered in the abdomen, had been formed within an abscess in the iliac region, which appears to have been injured by the fall. Whenever suppuration has taken place, the pain and fever usually become milder. The renewed exacerbation of symptoms denoted the rupture of the abscess; and the effusion of pus into the cavity of the belly was indicated by the sense of weight. The seat of the abscess fully explains the pain in the loins.—*Morgagni*, 10.

In a former article I have attributed pain in the loins to another cause, namely the connexion of the appendages of the diaphragm, and the influence of a cause in the thorax acting upon them. It might also arise from rheumatism, from serum in the tube of the lumbar vertebræ, and diseases in the viscera connected with the back, as the pancreas.—11.

Ichuria renalis.

The total deficiency of urinary discharge arises

either from disease in the kidneys or ureters, or in the bladder and urethra. Neither Valsalva nor myself have ever dissected the body of a person who died exclusively from the former cause. We cannot be surprised at this circumstance, for as the kidneys and ureters are double, if the office of one should be suspended, the defect will be supplied by the other. Although many have entertained the opinion, it is not always true that when one of the kidneys becomes inactive, the functions of the other will also be suspended. Certainly, a suppression of urine, from disease in the kidneys and ureters, occurs much more rarely than retention of urine, from disease in the bladder or urethra.—*Morgagni*, xli. 1.

Some additional remarks on this subject, and on vicarious discharges, will be made in the ensuing section.

SECTION II.

DISEASES OF THE BLADDER, PROSTATE GLAND, AND URETHRA.

Ischuria vesicalis.

Some observations on this subject have been already adduced, I shall therefore only subjoin such as have not been brought forward.

CASE 1.

Retention of urine; serous fluid in the abdomen having a urinous odour, and unusually coagulable.

A young husbandman, after the removal of scabies,

experienced a stoppage of urine, accompanied with vomiting; and he sometimes felt pain in the left lumbar region. Afterwards, however, he several times discharged urine, but it was in small quantities; in colour it resembled a saturated lixivium, and the discharge was attended with pain. The introduction of the catheter was attempted in vain. At length the whole body swelled, respiration became laborious, and he died on the following day, which was about the twenty-first from the commencement of retention.

Dissection. The kidneys were somewhat enlarged, and the bladder contained about two pints of urine, similar to that which had been voided. In other respects these viscera were healthy. In the abdominal cavity there was a redundancy of limpid fluid, the odour of which resembled that of urine. When this fluid had been kept in a glass vessel it separated into numerous broken parts like those apparent in urine. When set upon the fire, it at first became turbid, and similar to the whey of cow's milk; soon afterwards it appeared like milk itself; and ultimately it coagulated to such a degree as perfectly to resemble the white of an egg. Valsalva had never witnessed a concretion like this from any morbid humour of the body.

The lungs were greatly distended with air, and, posteriorly, they were connected to the back; but their texture was natural.—*Valsalva*, xli. 4.

The detention of a large proportion of urinary matter in the blood at length proved fatal, though it was deposited in other parts, especially into the abdominal cavity; for this excrementitious fluid readily blends itself with other secretions. In the person of his preceptor Natali, Malpighi found one of the ureters and the corresponding kidney surprisingly dilated, from the urine being intercepted by a calculus.

The retention, which, in the end proved fatal, lasted many days, and the patient observed that his saliva had both the odour and flavour of urine; and he perceived that the halitus transpiring through the skin, possessed the same urinous character.

Albertini informed me that the noble youth, the structure of whose kidneys has been described by Malpighi in the letter to Sponius, not only spat saliva which had the taste and smell of urine, but the colour, as well as the flavour and odour, demonstrated that it was little else than urine. The cheeks and parotid glands were tumid. Perhaps it was in consequence of this discharge of urine by the mouth that he lived so long, till, the suppression being overcome, he voided a great quantity of water. It happened to this patient, however, as it often does to others, that in consequence of the viscera and humours being vitiated by the protracted retention of urine, death soon afterwards took place.

In cases of suppression of urine, Thomas Bartholin mentions vicarious excretions by stool, by vomiting, and by perspiration. On one occasion Vallisneri observed that, after the tenth day of suppression, a vomiting of serum came on, and the fluid ejected resembled urine in its colour and taste, as well as odour.

A physician at Mantua met with a similar occurrence in a maiden, which lasted at first upwards of forty days; and soon afterwards two and thirty; and another physician observed this suppression and the substituted vomiting continue for fifteen months, so that the patient could scarcely be supported by any other means than nutritive clysters. At length, the obstructing calculus was discharged, when the ischuria, and the vomiting of urine disappeared.

In relation to vicarious perspiration, Bartholin has particularly distinguished the observation of Carolus

Piso, in which there was constant and copious perspiration, of long continuance, and so fetid that the odour was nearly intolerable: however, when a discharge took place from the urinary organs the disease was removed.

Petrus Hannius speaks of a maiden who was not so fortunate as the individual just alluded to. She had long been afflicted with suppression of urine from calculi, and he despaired of her recovery. A most profuse perspiration came on, and a prodigious quantity of sweat, having a urinous odour, poured from the skin, and as long as it continued, which was for several days, she experienced considerable amendment. But when this evacuation ceased, she was carried off within a few days by hydrothorax.

On the report of a physician of unquestionable authority, Marcellus Donatus gives the history of another maiden at Padua, from the region of whose stomach many pounds of a fluid transpired, which resembled urine both in colour and smell. In this instance the natural evacuation from the intestines was obstructed, as well as the renal excretion.

Even insensible perspiration appears to have supplied the defect of renal secretion in a well-known young woman at Verona, mentioned by Zeviani; for at that time she had not voided a drop of urine for twenty-two months. In the bed-chamber of this woman an odour of urine was perceptible, which the bedclothes appeared to exhale. She was afflicted with numerous diseases, but the brain remained healthy. The Paduan maiden ultimately fell into marasmus.—5.

I am indebted to Marisati for the following case.

CASE 2.

Retention of urine, unattended with apparent visceral lesion.

A man, lying in this hospital on account of a retention of urine, had already had a considerable quantity drawn off twice by means of the catheter. The patient, or some other persons, feared that the neck of the bladder might be irritated by the introduction of the instrument, and it was not repeated: consequently death ensued, and was attended with convulsive affections.

Dissection. All the viscera, even the bladder, were found apparently in a healthy state, except that the latter was distended by a vast quantity of urine.—*Morgagni*, xli. 8.

To what a degree I have repeatedly found the bladder distended without its being inflamed, has been demonstrated by cases already detailed; but this fact will be shown more particularly by a case which remains to be related under the subject of lameness. The following instance enables us to form some idea how much the coats of the bladder may occasionally be extended without any injurious consequences resulting.

CASE 3.

Retention of urine during labour.

A lady with whom I am well acquainted, was in labour with her first child, and on account of her being upwards of forty-two years of age, the parts about the pelvis were rigid, the lower part of this cavity was narrow, and the large head of the child lodged there. The urethra and the nearest portion of the bladder were compressed by this means, and the ex-

pulsion of urine was prevented. The short female catheter, after great difficulty, was introduced, but being of no avail, one of the largest male catheters, less curved than usual, was passed, and even when it had entered to an extent of three inches, no urine issued; but on its being pushed still higher, four pints were drawn off. She was a very small woman, and as the inferior part of the bladder was compressed, the fundus must have been greatly extended. A dead and putrid fœtus was soon afterwards removed, and the bladder sustained no injury.

To say nothing of rupture of the bladder, (which has happened from retention of urine, even in the ox,) the result of great distention, in most of the examples, has been far otherwise than what it was in the woman in question, either from a different disposition and nature of the parts, of the blood, or of the urine itself.

It is generally known that when the bladder has been distended to a very great degree, it frequently loses its contractile power, and this may sometimes happen in a very short time. Mauchartus relates that after an attack of ischuria, which had commenced four days previously, and the urine had been drawn off more than once in the latter two days, he found the bladder quite empty after death, but it was very large, and not in its usual contracted state. Nor is it less commonly known, that the bladder is easily affected with inflammation and all its consequences. The most frequent result of inflammation is gangrene degenerating into sphacelus; but ulceration sometimes occurs.—*Morgagni*, xli. 9.

CASE 4.

Gangrene of the bladder from retention of urine.

I never remember to have seen more extensive

gangrene than had taken place in the body of a rustic who had been subject to disorders of the kidneys, bladder, and intestinum ileum; and who for some days before his death, was incapable of expelling his urine.

Dissection. The lower parts of the abdomen, and especially the viscera, were of a blackish colour. The bladder and scrotum were implicated in this morbid process, and a portion of intestine was incarcerated in the latter situation.—*Morgagni*, xli. 10.

I do not know whether the strangulation of the bowel preceded the retention of urine, but they were joined together—a circumstance to which I have adverted on a former occasion.

There are many other causes situated exterior to the bladder, which obstruct the expulsion of urine. I have just mentioned the pressure of a fœtus upon the cervix of the bladder, in a case of difficult parturition; and during utero-gestation, especially within the latter part of the term, I have known some females who could not micturate except in the supine posture.

A glandular body, larger than a man's fist, has been found growing to the female urethra. Very acrid remedies, applied to the pudendum for the purpose of constricting the parts, have produced violent inflammation, and a fatal retention of urine. Great accumulation of indurated excrement, or very tumid hæmorrhoids, may compress the neck of the bladder against the ossa pubis, and completely prevent the discharge of urine.

Giovanni Amatorio, who was a very successful surgeon, informed me that when the fibres at the lower part of the bladder are tumid, from an accumulation of blood, or a deposition of humours, great advantage may be derived from the application of leeches to the hæmorrhoidal veins. By this means

he removed retention of urine in an old gentleman whose water had been drawn off by the catheter ninety times, and many other remedies had been employed in vain.

When the intestines are occupied by scybala, emollient enemata are the most efficacious remedy. Stimulating ones may excite inflammation, or, if it had previously arisen, may increase it.

The causes of retention of urine in the bladder ought to be very carefully distinguished, for this viscus, at one time, loses the power of contracting, from paralysis, and, at another, from distention. However, we must not suppose that the contractile power inherent in the muscles of the bladder, is always so easily destroyed by distention as may be inferred from the preceding example quoted from Mauchartus.—11.

There are many other causes which occasion ischuria vesicalis, and forbid the use of stimuli; and I would extend this remark to the application of cold to the feet. A tile or brick, which had previously been immersed in cold water or ice, applied to the feet, has excited the languid powers of the bladder by stimulating the extremities of the crural nerves; but these irritations may be exceedingly injurious when the retention has commenced from acrimony of the urine, or when the bladder is deprived of that mucus with which it is smeared over to defend it from the stimulus of urine.

Sometimes the bladder is prolapsed into the scrotum in men, and an analogous prolapsus has been described in females. In such cases the prolapsed part must be raised up with the hand, or a compress, and thus the urine should be discharged. Calculi, spasm, ulceration of the coats of the bladder, and tubercles, sometimes occasion retention of urine; and stimuli administered under these circumstances will be exceedingly detrimental.

Tubercles and excrescences sometimes form within the bladder or at its neck; and, at other times, in the meatus urinarius, where the tubercles have occasionally suppurated, and by the timely discharge of pus the retention has been removed. In such a case, the irritating properties of the remedies alluded to would necessarily prove injurious. Although tubercles of this kind suppurate, we cannot indulge any reasonable hope that scirrhus tumours, or tumours the hardness of which approaches that of scirrhus, which are often found in the prostate gland, or produced from it, should either be removed spontaneously, or even admit of removal by art.—12.

CASE 5.

Retention of urine from an enlarged prostate gland.

A man, seventy years of age, had long been afflicted with ischuria, so that he discharged no urine except what was drawn off with the catheter. As the disease daily increased he came into the hospital of St. Mary de Vita, at Bologna, and died there, under laborious and stertorous respiration, whilst an attempt was made to introduce the instrument.

Dissection. The fibres of the urinary bladder were so enlarged, as in figure and strength to resemble the strong bundles of fibres within the heart. From the prostate gland a pyriform excrescence arose, which scarcely left any passage for the urine; and, at the lower part, it had been affected with inflammation, from the continual impetus of the catheter.—*Valsalva*, xli. 6.

The inflammation evidently could not have occasioned this man's death. It is not difficult to conceive, however, that the blood gradually would become greatly vitiated in a body weakened by old age, and frequent retention of urine: and retention coming on, which could not be removed by the

catheter, such symptoms might arise during the fruitless irritation of the instrument, as, at length, carried off the patient within a short time.

Morgagni, 7.

CASE 6.

Retention of urine from enlargement and induration of the prostate gland.

A fellow citizen of mine, who was upwards of sixty years of age, robust, rather corpulent, and ruptured, had laboured under virulent gonorrhœa when young, and had always drunk wine freely. In the year 1709, he had slight retention of urine, and on the twelfth of March 1710, it almost suddenly became totally obstructed. Clysters, baths, and the abstraction of blood from the hæmorrhoidal veins, were employed to no purpose. The catheter was introduced with considerable difficulty, and seven pints of urine were drawn off. He survived about fifteen days, within which time the same quantity was drawn off several times, although he drank sparingly. Sometimes a little blood was seen in the urine, and occasionally substances resembling small fragments of thin membrane. A few days before death pain came on in the right shoulder, and two days antecedent to that event, febrile symptoms arose. In the morning of the last day when the catheter was withdrawn, the instrument, for the first time, appeared as if it had been dipped in a vitriolic fluid. Irregularity and intermission of the pulse came on, accompanied with tremor, and he died in the course of the night. I was requested to attend the dissection.

Dissection. The peritoneum was livid, especially in the hypogastric region; and the intestines gene-

rally had the same hue. At the extremity of the fundus of the distended bladder, the blood-vessels externally were turgid; and the inner coat, in some places, was reddish. The parietes of the bladder were thickened, and on this account, even when the urine was removed, the bladder retained an unusual magnitude. Before the bladder was entirely emptied we observed a coagulum of considerable size floating in the urine, and it bore greater resemblance to a semi-lacerated hydatid than to any thing else. However, on more attentive examination, it appeared to be a concretion of lymph, having laminæ involved one within another; and was of the same nature as the fragments which had been voided.

The cause of the retention was seated at the lower part of the bladder, and consisted of general enlargement of the prostate gland, which had also become so indurated that its texture resembled a mixture of cartilage and ligament. The gland was of a white colour except that in some places, particularly on both surfaces, it was blackish from congestion of blood in the vessels; and this turgidity was greatest on the right side, where the scrotum was partially distended with an enterocele.

Morgagni, xli. 13.

Some doubts were expressed, whether the catheter had been employed sufficiently early in this case. There are various states of the parts themselves, as well as of the body, which warrant delay; but I confess that in a similar case which I was attending about the same time, I was not sorry for having used the instrument early, after more easy measures had failed. The surgeon considered the operation premature, because, as there was but little tension in the hypogastrium, he supposed the bladder did not contain any urine. This opinion, however, was immediately refuted, for no sooner

was the catheter introduced than it drew off three pints of urine, greatly to the patient's relief, who was surprised how it could happen, that he, who drank so little, should have so large a quantity of urine in his bladder. He was not aware that retention of urine was often associated with an affection of the diabetic kind; and this circumstance has sometimes led me to doubt whether the redundant secretion of urine might not itself be a cause of retention; for by speedily distending the bladder to a great degree, whilst the patient is asleep, when he awakes the muscular coat may be unable to contract.

It is probable that this accumulation has also sometimes taken place during continued and dangerous fever, when the sensations have been obtuse.—14.

Without adverting to the wonderful accounts which are related of the true diabetes, some of which should be received with caution, the occasional conjunction of a kind of diabetes with retention of urine, leads me to notice the extraordinary quantity of urine which has sometimes been voided, in what is termed spurious diabetes; and the two instances to which I shall refer can be fully authenticated. Within ninety-four days a maiden at Venice expelled three thousand six hundred and seventy-four pints of urine; and another at Bologna, in the space of ninety-seven days, discharged four thousand one hundred and seventy-one pints. Both of them drank little or nothing, and, like persons labouring under hydrophobia, they were extremely thirsty, yet abhorred the sight of all liquids.—15.

In the case prefixed to these remarks the cause of retention unquestionably was the enlarged and indurated gland; and similar cases often occur. It does not always happen that the whole prostate is

tumid, for often there is a protuberance only of the upper circumference, which either wholly grows out, or only at a particular part; and it projects to such a degree as to prevent the expulsion of urine. There are examples of this circumstance in the Sepulchretum; and many instances have occurred to me, in which this part was beginning to protrude. Of this circumstance the following case affords an example.—17.

CASE 7.

Enlargement of the middle lobule of the prostate.

A husbandman, seventy-five years of age, died of ascites in this hospital in the year 1741. At that time I was engaged in demonstrating the organs appropriated to the secretion of urine and semen, and these organs, therefore, were removed from the body, and were the only parts examined.

Dissection. The scrotum was swollen, as it frequently is in ascites. There was a great quantity of serous fluid in the cells of the dartos, and but little within the tunica vaginalis. However, from the albuginea those small bodies were protuberant which I generally consider as the remains of hydatids.

When the anterior portion of the parietes of the bladder was opened longitudinally, I observed in the opposite part, adjacent to the orifice, and in the very middle, a roundish protuberance, the size of a small grape, and covered with the inner coat of the bladder. Its nature I immediately conjectured, and by thrusting the scalpel into it, I divided the projecting body and the prostate gland at the same time, and demonstrated that the former was continuous with the latter. Undoubtedly, had it grown out to a greater degree, it must have become a very considerable impediment to the discharge of urine.

Morgagni, xli. 18.

If the examples in the Sepulchretum are attentively examined, as well as the cases which occurred to Valsalva and myself, it will be observed that this lesion was exclusively found in old men. And in all the instances which fell under my notice, in which there was a commencement of caruncle, it arose posteriorly from the very middle of the internal and upper circumference of the gland. But whether these circumstances happened casually or not, further observations must determine.

These excrescences of the prostate gland, however, are occasionally found double. Thomas Bartholin, at Padua, met with cases of this description, and described the morbid appearance as two tubercles, consisting of white and glandular substance, having the figure of the testes, and resembling them in size. They were situated immediately above the orifice of the urethra; they yielded to a syringe when introduced; but fell immediately back into their former situation, when that instrument was withdrawn.—19.

Since writing the preceding account I find, that what I have described as an incipient excrescence of the prostate gland, an anatomist of celebrity has considered natural to it, and has described it under the appellation of the *uvula*; but I cannot reconcile this with my own observations. In the great number of bodies which I have examined, I have only observed this appearance in the cases which have been alluded to, and in another man, in whose bladder the body in question projected from the posterior part of the orifice of the urethra, in the shape and of the size of a small cherry; and its structure was evidently an extension of the prostate gland itself.

I have seen other excrescences indeed, but they arose on the sides of the orifice, and were not in continuity with the substance of the gland.

Morgagni, lxxvi. 5.

The result of enlargement of the prostate gland is not always a retention of urine, for often it occasions a stillicidium. As the disposition of circumstances varies, a diversity of inconvenience is induced. More or less impediment to the egress of urine, however, generally arises from these prostatic productions.—11.

The following instance shows, that even in the female there may be an appearance of incontinence of urine, when the bladder is actually distended.

CASE 8.

Retention of urine ; thickening of the coats of the bladder ; dilated ureters ; cancerous uterus and vagina.

A woman who appeared to be nearly forty years of age, had been affected with uterine hæmorrhage, which was succeeded by a discharge of white matter from the uterus, accompanied with severe pain in the hypogastric region and in the subjacent parts, especially in the night. She also perceived a degree of tumefaction in this part, and said that some smaller tubera, which formerly were scattered in the middle of the hypogastrium, had coalesced. Twelve months had elapsed from the commencement of this affection, when the tumour was found in the state which has been mentioned ; but it ascended so high as scarcely to be two digits from the umbilicus. It was of a proportionate width, and was so prominent externally as to be visible. Its figure was roundish, its surface was uniform, and it offered resistance to the fingers. A constant dripping of urine came on, accompanied with spasmodic pain in the throat, nausea, occasional vomiting, emaciation, and fever. She was so debilitated and broken down by these affections about the beginning of 1741, when she came into the hospital at Padua, that she died within six

or seven days : and none entertained a doubt that there existed a cancerous tumour of the uterus. This organ was, indeed, partially destroyed by cancerous ulceration, but the protuberance did not arise from that cause.

Dissection. The abdomen being opened, it instantly appeared that the bladder, distended with urine, constituted the large tumour—a circumstance which nobody would have supposed, because urine had continually been running from her. The anterior part of the bladder had become adherent to the parietes of the abdomen high above the pubes ; and, with the exception of this surface, and a portion of the fundus, the coats were so thickened as to equal the thickness of a finger. The inner membrane of the bladder was healthy, though, in some places, small vessels were turgid. On each side of the orifice of the bladder a white body was prominent internally, of an irregular figure, and equal in size to the apex of a man's thumb. They were produced from the substance that surrounded the urethra, and this substance was universally thickened and indurated, and of a white colour. The ureters were greatly dilated, and that part of each which passes between the coats of the bladder was unnaturally prominent, and terminated in an orifice wider than usual. One of the ureters was full of urine, and the other appeared to be filled with air. Even the tubuli and pelvis of each kidney had undergone dilatation.

The ovaria were closely connected with the parietes of the pelvis, and of a white colour. The left was about the size of a large chestnut, and the right was equal to a small nut. The latter contained a little serous fluid, probably within some kind of vesicle ; but there was nothing beneath the coat of the former except a soft and white matter like suet. The parietes at the fundus of the uterus were softer

than they usually are, but the cervix and nearly the whole of the vagina were made up of very thick, white, and hard parietes. The internal surface of the cervix uteri, and the orifice, and more especially the vagina, were eroded by deep ulcers, which in some places were white, in some of a black and bloody colour, and in others cineritious. From these parts a putrid secretion, tinged with their respective colours, could be scraped off with the handle of the knife; and all the adipose and membranous substance, which is usually found at the sides of the vagina, was converted into the same hard and white substance of which the vagina itself consisted.

Morgagni, xxxix. 33.

In many respects this case may be useful by tending to excite caution. Under all the circumstances which have been related, who would not have supposed that the tumefaction in the hypogastric region, was a tumour of the uterus? The detached tubera, perceived at an early stage of the disease, were probably the intestines forced upwards and compressed by the distending bladder. Who, being informed that the urine was dripping away, would have suspected that the bladder was distended with urine and which by an adroit introduction of the catheter might have been removed, to the great relief of the miserable patient? In a parturient woman who believed that there was no urine in her bladder on account of a similar stillicidium, Ruysch, at length, detected its fulness; and a large quantity was found to be retained.

Therefore, whenever there is a tumour in the hypogastric region of women, although symptoms of a diseased uterus may not be wanting, we ought not to be unmindful of the bladder, which is situated anterior to the uterus. Even should we be informed that the urine issues from them involuntarily, we

must not take it for granted that none remains. And in those cases in which it is certain that the vagina is ulcerated, as well as the uterus, we are not always to infer, that should there be a stillicidium urinæ, it is attributable to the ulceration of the annexed urethra and bladder. In the preceding case neither of these parts was ulcerated, but, what is an extraordinary example of cause and effect, a scirrhus induration of both of them produced an incontinence of urine and a retention at the same time. The hard parietes of the urethra did not admit of such constriction as properly to close the orifice of the bladder; and the indurated coats of the bladder, or, at least, of the greater part of them, could not so contract as to expel its contents, and the remaining portion of these coats had coalesced with the anterior parietes of the abdomen.—34.

Retention of urine often arises from affections of the urethra, some of which will be spoken of here after.*

* Morgagni has very justly intimated that suppression of urine is a much more rare occurrence than retention; but as it sometimes occurs, it is of considerable importance, for practical purposes, to distinguish the two conditions. The renal ischuria, as well as the vesical, may be total or partial, and it has been supposed to arise from inflammation and other morbid states of the blood-vessels, from obstruction in the secreting tissue, from spasm, local paralysis, certain passions of the mind, and as a symptom attendant upon some general diseases, as nervous fever.

Retention of urine may arise from a great diversity of causes, and some of them I shall briefly enumerate.

Although no urine should descend into the bladder, there may not exist any deficiency of the renal functions. For after the urine has been secreted, it may be retained in the pelvis of the kidney, or in the ureters. If detained in the ureters, Morgagni has shown that they may become greatly dilated, and their parietes thickened. Urine may be arrested in its progress through these tubes, 1st, from calculi, hydatids, coagula, worms, pus, or mucus of a dense consistence; 2d, from affections of the parietes,

Coats of the bladder thickened.

The coats of the bladder are often found thickened after urgent and protracted dysury, not only when it arises from calculus, but also when it

as inflammation, swelling, spasm, and some other lesions to which membranous canals are liable; 3dly, from affections of the adjacent parts, as encysted dropsies, distended bowels, tumours, or scirrhus affections of the rectum, womb, ovarium, or bladder; and it has been attributed to inflammation of the bladder.

When the urine is retained in the bladder, it has been shown not only that the capacity of this organ has been so extended as to form a distinct elevation above the pubes, but, the valve of the ureters being obliterated, these canals, and the pelvis of the kidneys, may likewise participate in the dilatation. The bladder has been so enlarged under these circumstances as to contain eighteen pints of urine. The causes of ischuria vesicalis may be seated in the bladder itself, in the urethra, or the adjacent parts. At an advanced period of life, the contractile power is sometimes lost from paralysis; but this impediment may arise at any age, especially from injuries of the spinal marrow. In old age, too, the whole of the coats have been found cartilaginous, or this degeneracy has taken place only in the inner coat. The bladder is sometimes rendered unable to contract from inattention to the calls of nature, and this is particularly liable to occur after the person has drunk copiously, or has taken diuretics. Retention may be occasioned by tumours and hernia of the bladder; by extraneous bodies, as calculi, hydatids, worms, or coagula; and it has been said to arise from inflammation. Mechanical impediments pressing upon the cervix vesicæ, or obstructing the orifice, may also render the patient unable to expel his urine. The most frequent of these causes is an enlargement of the prostate gland, and generally from a projection of its middle lobule; but it may be occasioned by the pressure of the gravid uterus, or a displacement of this organ; by tumours, or by the pressure of the child's head during protracted labour. In addition to the causes mentioned by Morgagni as obstructing the canal of the urethra, we might name inflammation and laceration of the inner membrane, spasmodic and permanent strictures, tubercles in the parietes of the canal, and tumours in the perineum.

The bladder seems not only capable of sustaining a great degree of dilatation, but also of recovering from other important lesions. Patients have been restored after it has partially

originates from an excrescence of the prostate gland. In a case of this description which will be related when treating on the subject of calculi in the urinary bladder, the fibres of the bladder were so enlarged as to resemble the strong fasciculi of fibres in the heart. Ruysch mentions cases in which they were thickened to the extent of a digit, and the cavity was nearly obliterated. Riverius has described similar occurrences, and amongst other cases mentions one calculous patient in whom the bladder had become externally fleshy. It is related in the *Sepulchretum*, concerning a girl who had also been the subject of febrile disease, that the inner coat of the bladder had been destroyed by ulceration, and the fleshy fibres of the outer coat were so affected with inflammation that the whole of it appeared to be fleshy.

With this case we might join that of Camerarius, in which he found the bladder like a fleshy mass, the parietes being two inches in thickness, and the cavity scarcely larger than a nutmeg. We are the less surprised at this circumstance from recollecting the particulars of a case detailed in the *Acta Helvetica*. The coats of the bladder were of such immense thickness, that although the bladder itself was almost equal in size to the head of an infant, the cavity was scarcely capable of admitting a nut.

I have just described the fibres of these coats as resembling the lacerti or fasciculi of the heart, and this comparison has been employed by other anatomists. Indeed, no other can appropriately be employed by those who meet with the bladder in the

sloughed, from long continued pressure during labour. Mr. Hennen has mentioned a case in which the bladder was penetrated by a ball, yet the patient recovered. Two pieces of cloth carried in with the bullet were voided, but the ball was not found.—*Ed.*

state which Trew has described and delineated. The inner coat was destroyed, and of the muscular he says, *pro fibris tunicæ muscularis ostenderet varios mirumque in modum collectos lacertos, magnis intercedentibus lacunis distinctos*. The bladder, whose parietes were in this state, contained large and rough calculi. Thickening of these parietes has occasionally been conjoined with ulceration; and sometimes it has appeared to arise from acrimonious urine.

I have already shown that the parietes of this viscus may become thickened, and its fibres enlarged, when it does not contain a calculus. In persons addicted to excessive drinking, the urine solicits the bladder to frequent contraction, and consequently may induce this state of the bladder: and any other cause which acts as a stimulus to it, excites an increased determination of blood to its vessels, and occasions thickening of the coats. Therefore, although this augmented thickness usually arises from an impediment in making water, it sometimes originates from other causes; and when it has taken place it may tend to increase the difficulty if it previously existed; or it might produce it. This I shall briefly demonstrate after having related the following case.—*Morgagni*, xlii. 33.

CASE 9.

Thickening of the coats of the bladder; enlargement of the heart, and disease in the aorta; the pharynx thickened.

A sailor, fifty-five years of age, rather fat, addicted to drinking, ruptured, and accustomed to void his urine with difficulty, came into this hospital. He was not admitted, indeed, in consequence of the affections alluded to, but on account of pain in the fauces. In the morning, he walked through the hospital, but

soon retired to bed again, where, not long after, he was found dead. When first discovered his face was black, but it speedily became pallid. This circumstance happened about the end of January 1733, when I had commenced the anatomical lectures, and the body, still warm, was brought into the college the day after the fatal event.

Dissection. The omentum was drawn above the stomach; the liver was elegantly marbled with reddish and whitish streaks, and was rather large; but the spleen was larger in proportion, although this organ was not of an extraordinary size. The kidneys and ureters were in a healthy state, but the bladder was enlarged, and its coats were exceedingly thickened. The urethra was free from lesion. There was a hernial sac in the scrotum, but it was empty.

The trunk of the aorta was somewhat tortuous where it lay upon the lumbar vertebræ, and its coats exhibited some white spots. There was some tortuosity also in the iliac branches, which were not only beset with opaque spots but were partially ossified.

The heart was enlarged; in some places the semilunar valves were indurated, and the sides of the anterior mitral valve were ossified. Near the heart, the aorta exhibited more numerous spots than in other parts, and these would soon have been converted into bone. Between the heart and the curvature, the aorta was somewhat expanded, and was rugged internally from thick and rather tortuous rugæ; nor was it entirely free from slight appearances of erosion. There were no spots in the carotid arteries; and I had not an opportunity of inquiring after the cause of the sudden death by examining the head.

The sides of the pharynx, of which this man had

complained, were thicker than usual, and by cutting into them, I found that the thickness was in the substance of the pharynx itself, which, being unusually distended, resembled structure having an intermediate nature between glandular and viscid substances.—*Morgagni*, xlii. 34.

There was nothing in this case to which the difficulty of making water could be imputed, except the extreme thickness of the coats of the bladder. I do not suppose, however, that a dysury would result from every species of thickening. It would not be likely to arise from that state in which the fleshy fibres are naturally enlarged, and which would render them still more capable of contraction; but from that in which not only the fleshy fibres are enfeebled by the deposition of extraneous juices in their interstices, but the remaining coats, also, are in such a state of infarction as to render them less flexible, and on that account they obstruct the contractions of the bladder. In some of the preceding cases the coats of this viscus were not only thickened but also hard and callous, so that although they were not all universally adherent to the pelvis, as happened in a case which occurred to Hottinger, yet they contracted with difficulty, and the expulsion of urine required violent straining and exertion. These symptoms we may frequently observe from the same cause in calculous patients, unless the urine flows involuntarily from debility of the sphincter. In a nobleman of Pistoia, Targioni saw the coats of the bladder not only a digit in thickness, but also callous and full of steatoma; so that not admitting of extension they were capable only of containing a very small quantity of urine between themselves, and a large calculus which occupied the cavity.

Narrowness and coarctation of the bladder are usually conjoined with thickening of the coats, and the efforts employed to remove the disease often subject the patient to increased uneasiness and danger. If the catheter is introduced, it is difficult to give it the necessary motion to ascertain whether a calculus exists or not; and if violence is used, the pain becomes intolerable. When the bladder is cut into, under these circumstances, its coats being thick, and constricted about the calculus, considerable impediment may arise in its extraction.

These remarks relative to the diminution of the vesical cavity, in conjunction with thickness of the coats, and difficulty of extension, are not only important to the lithotomist, but also extremely momentous to the physician. For if a person subject to dysury is seized with ischuria vesicalis, the practitioner, duly impressed with these facts, will not suffer himself to be deluded, and suppose it premature to draw off the water should there be but little tension in the hypogastrium. From a slight but very painful tension in that part, he will infer that as much urine has already accumulated as the narrow and little extensible bladder can contain; especially if the patient is far advanced in years, and if, before the retention, he had been habituated to make water very often, and to void but little at a time. Under considerations of this kind, it has been my custom opportunely to accelerate the removal in cases of retention of urine, and I have never had occasion to repent this practice.—35.

I must briefly advert to some impediments to the discharge of urine which are found in the urethra. Already I have spoken of induration and enlargement of the prostate gland, which comprises the commencement of this canal. Sometimes an abscess forms in this gland, and it may not only swell and

ulcerate, but become callous. If the pus is effused, there may be an unnatural freedom for the transmission of urine, and the same effect may arise from ulceration, in consequence of the action of the sphincter being destroyed; so that a stillicidium urinæ might be produced. When the circumstances, at one period, are precisely such as now described, and, at another, the gland becomes tumid from returning suppuration, there will, at one time, be incontinence of urine, and, at another, dysury. The latter may degenerate into a very dangerous retention, and the danger will be increased if the inflammation, or the hardness and tumefaction of the gland, forbid the employment of the catheter. These circumstances have occurred to others as well as myself; and in 1714, Valsalva was consulted in behalf of a knight, in whom retention took place under these circumstances; on which occasion he suggested that if an instrument could not be passed through the natural channel, the bladder should be punctured.—36.

Prostatic calculi, and other lesions in the urethra.

Calculi have sometimes been found in the prostate gland. In one of the cases which occurred to me, there could be no emission of semen, because the calculi were situated so as to prevent its escape; and this instance brought similar ones to my recollection. Marcellus Donatus, speaking of a man in whose prostate he found a calculus, says, *Non potuisse semen, nisi paucum admodum, aquosumque valde in coitu excernere*. Lossius ascribes impotence to this cause; and Nicolaus de Blegny relates that seminal ejaculation had been prevented in consequence of the *vasa ejaculatoria* being full of hard concretions, most of which, in their shape and size, re-

sembled a pea. Rhodius found a calculus in this part by which the orifice of the bladder was compressed, and the expulsion of urine prevented. Ter-raneus found small and unequal calculi lodged in the ducts of the prostate, and at the orifices of the vasa deferentia, from which circumstance the patient suffered uneasiness, and both the discharge of urine and the emission of semen were obstructed. James Douglas found some small hard bodies, similar to white peas, in the substance of the prostate gland, and others adhered by small roots to the membrane which covered the gland. Additional instances might be adduced, but they do not afford any peculiar symptoms by which the existence of prostatic calculi can be ascertained. For though, in most cases, the ejaculation of semen is prevented, this is not a uniform result; and other causes might produce the effect alluded to.*—37.

I shall now briefly advert to some of the lesions which are common to other parts of the urethra. On a future occasion I shall allude to a case in which calculi were found beneath the internal membrane of the female urethra†, and shall not anticipate it, but will rather describe the appearances which presented themselves, at any part, through the urethra. A difficulty in expelling urine, as well as obstruction to the catheter, may be ascribed to various causes within the urethra. Amongst others, these impediments may be particularly attributable to cicatrices, to turgid and varicose blood-vessels, by

* Prostatic calculi have been found by Dr. William Hyde Wollaston to consist of phosphorated lime in a state of neutralization. According to Dr. Marcet they are composed of phosphate of lime, not distinctly stratified, and tinged by the secretion of the prostate gland.—*Ed.*

† Vide *Calculi in the uterus.*

which a coarctation of some part of the urethra takes place. The corpus spongiosum urethræ itself is said to protuberate within the canal at those parts where gonorrhœa might have considerably relaxed the inner coat. Goulard entertained the opinion that this was the most frequent cause of obstruction in the urethra, but that it was not observable after death, as the cause which dilated the cells ceased with the circulation of the blood, at the time of death; so that, by degrees, the protruded parts subsided, and left no trace perceptible to the anatomical inquirer. However, I believe that when they have existed in the living body, they will become visible after death, if the spongy part of the urethra is inflated, in the same degree as it had been distended with blood during life; and if the urethra is dried in this state, and cut into, undoubtedly the place within this canal where the obstacle had existed will be discovered. This author has not, indeed, denied that there are other causes of obstruction, such as contraction, corrugation, cicatrices, and sometimes even a fleshy excrescence. In the great number of urethræ which I have attentively examined, I have only once distinctly observed a fleshy excrescence, but many times have witnessed strictures and cicatrices; and the excrescence to which I have alluded was associated with these other morbid appearances.—38.

CASE 10.

Excrescence in the urethra.

A young man died in this hospital of a wound in the head, about the middle of December 1717.

Dissection. The stomach was enlarged, and exhibited scarcely any rugæ. The liver exceeded its usual bulk, and the hepatic artery was dilated.

There were many cicatrices on the kidneys; but they were more numerous on the glans penis, which had become very small, and exceedingly misshapen, owing to the large scars. From this extremity the urethra was very distinctly straitened through a third part of its whole length, and none of the larger canals which I have described in a former work were visible; but their place was occupied by an interrupted line, composed of a thin excrescence of luxuriant flesh.

The epiglottis was not perfectly healthy, and in the aorta there were incipient marks of ossification, and obscure traces of ulceration. Besides these appearances, the aorta, a little above the heart, was considerably dilated.—*Morgagni*, xlii. 39.

CASE 11.

Stricture of the urethra; diseased bladder and kidneys; ureter dilated.

About the same time I dissected the body of an old man who was a foreigner. That he had been affected with the venereal disease, as well as the young man of whom I have just spoken, the following appearances will sufficiently demonstrate.

Dissection. One of the kidneys was very large, but the other was contracted, and the ureter belonging to this organ was almost universally dilated to such a degree as to admit the point of my little finger. The bladder was large, and its parietes were thickened and purulent. The glans penis was hollowed out by numerous deep cicatrices, and the urethra was extremely contracted, so that I was scarcely able to demonstrate one of the small ducts.

The epiglottis was not perfectly healthy, and the

contiguous part of the tongue, which is covered with glands, in some places exhibited small ulcers.

Morgagni, xlii. 40.

In former articles I have mentioned other changes which had taken place in the urethra, as prominent fibres, oblong whitish lines, oblique and almost fleshy fibrillæ; and I shall specify other appearances when treating on the subject of gonorrhœa.
—41.

Excrescence, and other diseases, in the female urethra.

I have frequently dissected female urethræ, and attentively examined them, but hitherto, with a solitary exception, I have neither met with cicatrices nor excrescences; and this circumstance should not occasion surprise, because the canal is short, and not very narrow. However it is not wholly exempt from ulceration or excrescence. Astruc, more than once, has seen the substance which surrounds the female urethra suppurated and fistulous, and discharging pus by an opening in the urethra. At other times he found the urethra excessively straitened, from the same substance being tumid and callous. Alghisi mentions a maiden in whom a thin medicated candle had been left in the urethra to destroy a carnosity. Mullerus, too, has described a fleshy excrescence found in the urethra of a widow.

Examining the body of an old woman about the beginning of 1751, I met with a small triangular excrescence within the external orifice of the urethra, but it was not prominent: and very often, particularly after acute fevers, I have observed nearly parallel blood-vessels creeping through the internal coat of the urethra, so turgid and crowded that nearly the whole of the canal was black. In a

young maiden, and also in a woman advanced in years, I saw a portion of this coat prolapsed exterior to the orifice of the meatus; but although it was easy to conjecture what inconvenience in the expulsion of urine must have resulted, I was not informed on that point. I was unwilling to entertain the suspicion that the protrusion had arisen from the meatus's being frequently irritated by a needle or bodkin, especially as it might arise from strangury. That this membrane might be urged downwards by violent strainings to expel the urine, is not only accordant with reason, but has been confirmed by the observation of Mullerus. For the red and fungous excrescence, which was of the size of a bean, and proceeded from the orifice of the urethra, so as to close it, having been in a great degree removed, the remaining internal part was rendered conspicuous only by that kind of straining which is employed in emptying the bladder.

Corn: Solingen relates an instance of inversion of the meatus urinarius, which hung downwards the length of a finger; but a suspicion has been entertained that Solingen was deceived as to the nature of the pendulous part.

The female urethra being shorter, and having more laxity of structure than the male, small calculi frequently fall out; and occasionally, stones which are by no means of a small size, are extruded spontaneously. Various authors have described such instances, but I know of none in which the calculi were so large as in an instance mentioned by Senner-tus, and that recorded by Tulpus. The former says that the stone expelled was nearly as large as a hen's egg; and in the case spoken of by the latter, it weighed three ounces and two drams. I do not recollect to have read of any other calculus being expelled, which was so large as this, and, in-

deed, I believe it to have been of the greatest magnitude which a calculus has attained in the female bladder; but in the male bladder, I know that they have acquired an immense size. In the *Sepulchretum* human calculi are mentioned of thirty-two and thirty-four ounces; and Targioni asserts that there is one at Florence which weighs thirty-nine ounces; and it is more remarkable because it was found in a man, who, after a happy and vigorous old age, was carried off by a disease which excited little suspicion of urinary calculus.

Another of the same weight is noticed by Verducus; one met with by Launayus weighed fifty-one ounces; and Kesselringius asserts that he saw one in the possession of Morand equal to six pounds and three ounces. But we read of no such large calculi in the female bladder; and, undoubtedly, this is ascribable to the urethra being shorter and wider, so that the greater part of the viscid and calculous matter passes off. This matter being retained in the male bladder, enlarges the calculi by accretion.

Adolphus published a case in which an oblong calculus formed in the urethra of an old woman, and firmly adhered to it; and the circumstances just adverted to, contribute to render this occurrence the more extraordinary.—42.

Morbid appearances in the urine.

Urine is sometimes voided which is white and turbid like milk. About forty years ago, a controversy was agitated whether this appearance was occasioned by chyle or pus, but after a careful investigation of the conflicting opinions I expressed my belief that it arose from the latter. I was not ignorant, indeed, that chyle might be discharged from the kidneys if the secretory structure was greatly relaxed; but in

the patient whose disease led to this controversy, long before the urine had the qualities which have been mentioned, symptoms of lesion in one kidney had existed; and the same symptoms accompanied the discharge. After death the kidney of the affected side was found half putrid, and reduced to a very small bulk.

A purulent sediment in the urine is not always viscid, and that deposit which is most glutinous has been attributed by the most experienced physicians to the bladder: and, from his dissections, Valsalva was accustomed to ascribe this morbid secretion much less frequently to the kidneys than to the parts below them.—44.

The controversy alluded to was carried on at Padua; and at Venice there was another dispute, to determine whether or not blood was combined with the urine of a certain abbot, for none subsided, even when it had long been kept. On being consulted, I persuaded the disputants to institute the experiment of applying fire, assured, that if blood should be contained in the urine, by this means it would coagulate. This experiment at once terminated the discussion.*

* Invalids very properly attach great importance to the state of the urinary excretion; but although uniformly inquired into by practitioners, few possess any precise knowledge respecting its morbid qualities. I gladly, therefore, avail myself of an interesting abstract of these phenomena from Dr. Ure's Dictionary of Chemistry.

“The changes produced in urine by disease are considerable, and of importance to be known. It is of a red colour, small in quantity, and peculiarly acrid in inflammatory diseases, but deposits no sediment on standing. Corrosive muriate of mercury throws down from it a copious precipitate. Towards the termination of such diseases it becomes more abundant, and deposits a copious milk-coloured sediment, consisting of rosacic acid, with a little phosphate of lime and uric acid.

“In jaundice it contains a deep yellow colouring matter, capable of staining linen. Muriatic acid renders it green, and this

I have already intimated that concretions of blood which form in the ureters, or urethra, have been mistaken for worms.*—45.

indicates the presence of bile. Sometimes, too, according to Fourcroy and Vanquelin, it contains a substance analogous to the yellow acid, which they formed by the action of nitric acid on muscular fibre.

“ In hysterical affections it is copious, limpid, and colourless, containing much salt, but scarcely any urea or gelatin.

“ In dropsy the urine is generally loaded with albumen, so as to become milky, or even to coagulate by heat, or on the addition of acids. In dropsy from diseased liver, however, no albumen is present, but the urine is scanty, high-coloured, and deposits the pink-coloured sediment.

“ In dyspepsy, or indigestion, the urine abounds in gelatin, and putrefies rapidly.

“ In rickets the urine contains a great deal of a calcareous salt, which has been supposed to be phosphate of lime; but, according to Bonhomme, it is the oxalate.

“ Some instances are mentioned, in which females have voided urine of a milky appearance, and containing a certain portion of the caseous part of milk.

“ But among the most remarkable alterations of urine is that in diabetes, when the urine is sometimes so loaded with sugar as to be capable of being fermented into a vinous liquor. Upwards of one twelfth of its weight of sugar was extracted from some diabetic urine by Cruickshank, which was at the rate of twenty-nine ounces troy a-day, from one patient. In this disease, however, the urine, though always in very large quantity, is sometimes not sweet but insipid.”—*Ed.*

* The caution here given by Morgagni is a very necessary one, because concretions from extravasated blood, formed in the ureters or urethra, are liable to be mistaken for the animals they resemble. However, worms have unquestionably been voided from the urinary organs. In a case related in the *Medico-Chirurgical Journal*, (Sept. 1816,) a description is given of a worm said to have been expelled from the urethra. It was four inches long, as large as a lumbricus, had a flattened head like a leech, and was very lively. When examined by the microscope, rings could be distinguished on the thickest part of the body. A very interesting case, too, is related by Mr. Lawrence, in the second volume of the *Medico-Chirurgical Transactions*. Medical men, however, need excessive caution, because, from motives inaccessible to them, artifices are often employed which they are called in to sanction. I am acquainted with one instance in

Preternatural communication between the bladder and adjacent parts.

It has occasionally happened, that in consequence of inflammation, adhesion and ulceration have taken place between the bladder and nearest intestine, and a communication has been established between them, so that some of the contents of the latter, such as feculent matter, portions of leaves, roots, small grapes, and other undigested substances, have been voided with the urine.—45.

When there is a communication between the bladder and rectum, urine is expelled through this channel. The most ancient example of this fact is derived from Praxagoras, who relates that he had seen a man who had then excreted urine per anum for twelve years, but he was uninformed how long it continued afterwards. In the Sepulchretum there is the example of a man who, from childhood till his fiftieth year, had uniformly discharged urine through the anus; for a lithotomist having extracted a calculus from him when a boy, had so far injured the bladder, that after death an aperture, a digit wide, was found between the bladder and rectum. Abscesses sometimes form and occasion this preternatural channel for the discharge of urine; and sometimes it is the result of accidental injury. The bladder and rectum have also been ulcerated from calculi. In a nobleman who had discharged blood and urine from the intestines, Moraschius found a calcu-

which a deception of this kind was attempted with worms affirmed to have been voided from the bladder, but on minute inspection they were found to be small earth worms.

Hydatids have been discharged from the urethra, but I do not know that they have ever been found attached to the bladder.—*Ed.*

lus of the bladder adhering to fungous flesh, and the stone, at length, had perforated the bladder and intestinum rectum.

However, in some instances, there have been discharges of urine from the intestine, which appeared to be entirely unconnected with ulceration of the bladder.

The case of a boy is mentioned in the *Sepulchretum*, who, for ten years, had suppression of urine, but a few drops of turbid urine escaped from the anus. After death his kidneys and ureters were found in a state which must have totally unfitted them for their natural functions, and the bladder was not perforated.

In other cases of *ischuria renalis*, as well as in retention of urine, I have already shown that this fluid has been excreted by the anus. *Reusnerus* relates, that on the seventh day of complete suppression, a child voided urine from the intestines, which, in colour, smell, and quantity, resembled that which is naturally excreted. It was not combined with any feculent matter, or attended with pain; and it passed off about three or four times daily. At the expiration of some days the urine was again suddenly emitted through the urethra, without the least pain, or troublesome symptom; and it continued to be evacuated naturally during the succeeding years.

Therefore we must not attempt to explain every excretion of urine *per anum*, by supposing the existence of an unnatural communication; but where, in consequence of renal or vesical *ischuria*, the blood is overloaded with urinous particles, and there is no symptom of any preternatural canal between the kidneys or bladder and intestine, the case may be explained in the same way as I have accounted for a vomiting of urine, namely, from its being secreted by the intestinal glands.—46.

Abscess of the bladder.

That abscesses may form between the coats of the bladder, is shown by a case in which, from the tumefaction of the abdomen, and other symptoms, the woman was supposed to be pregnant; when, in fact, the prominence arose from a large abscess formed between the anterior coats of the bladder.

xxxix. 34.

CASE 10.

Ulceration of the bladder and vagina.

An old woman for seven months was afflicted with pain in the lower part of the abdomen, especially at the time of micturition; and, at length, the pain became exceedingly excruciating. She died in 1757.

Dissection. The ovaria were white and scirrhus, and of a small size. The whole inner surface of the vagina and of the bladder was ulcerated, and covered with fetid pus, with which the bladder was half filled. It appeared that these organs were the seat of carcinoma.—*Morgagni*, lxvi. 2.

Calculi in the urinary bladder.

I have found but two cases of this affection in the papers of Valsalva, and one of them has been already described on account of its relation to apoplexy.

CASE 1.

A boy, nine years of age, had for six years suffered from a calculus, which at intervals exceedingly annoyed him. His urine often contained filamentous substances, but it was of a natural colour, except when bloody from over-exertion: and frequently it escaped involuntarily. Sometimes by introducing the

finger within the rectum the calculus could be felt, but at other times it was imperceptible.

A lithotomist undertook to extract this calculus, and after having teased the boy for a long time, he with great force drew away a small stone; and perceiving that there existed another, he again tortured the little patient to such a degree that the pain almost suffocated him. The stone was broken, and, at length, he extracted a fragment.

Scarcely had half an hour elapsed when the boy began to vomit, and he constantly complained of violent pain at the lower part of the abdomen. Slight tumefaction of the abdomen was added to these symptoms, and was accompanied with fever, difficulty of breathing, and disquietude. He died in twenty-four hours after the operation.

Dissection. The bladder and surrounding membranes were inflamed; and at the anterior part, near the cervix, the bladder was lacerated. One half of the second calculus remained in the cavity.

Valsalva, xlii. 3.

The temerity or unskilfulness of the lithotomist in this case is inexcusable, and the fault consisted in not having made a sufficient opening.—*Morgagni*, 9.

It has happened in other cases besides this, that at one time a calculus could be distinguished by the introduction of a finger into the rectum, and, at another season, it was imperceptible; nor is even the introduction of a catheter at all periods satisfactory. Even Cheselden himself, as well as other surgeons, has sometimes not been able to detect a calculus though the catheter was introduced three times, and yet it was unquestionable that one existed.

Calculi have sometimes been latent in the bladder for many months, indeed, for several years. In the *Sepulchretum* a case is mentioned in which, during five successive years, scarcely any of the trouble-

some symptoms of stone remained ; and, in another case, this comparative immunity was experienced from childhood to the age of thirty-five ; yet in both cases the patients had previously been afflicted with those symptoms, and large calculi even then occupied the bladder.

In the bodies of some persons who died of decrepit old age, either a large calculus, or a number of calculi, were found in the bladder, and the circumstance excited surprise, because no complaint had been made of this disease. In relation to this fact I could multiply examples. In the year 1752, when teaching anatomy in the college, an eminent apothecary showed me a perforated calculus which had been voided by a female. It resembled that delineated by Alghisi, except in the greater narrowness of the foramen ; and I suppose it had formed at the orifice of the urethra. When sabulous and viscid matter abounds, particles of them remaining after the last drops of urine have been expelled, may sometimes concrete at the part where a hollow is occasioned by the projection of the prostate gland in the male, and of the corpus glandosum in the female, and here it may acquire an annular form, as if it had been cast in a mould. It may remain there till dislodged, and urged into the urethra, which in females is rather wide and dilatable. In this woman its passage was proportionately more easy in consequence of approaching an elliptical figure, one extremity of which was a little narrower than the other. She was a maiden, eighty-two years of age, and had not been warned of its existence by pain or even by an uneasy sensation ; she had only noticed that the urine was sometimes voided in a more slender or thread-like stream than usual. However, when the calculus fell into the urethra, it suddenly excited pain, and produced efforts for its

expulsion; so that within half an hour it became prominent, and was removed by the fingers. No unpleasant consequences resulted.

Although the foramen allows the transmission of urine, however, it does not always prevent the supervention of uneasiness. Several cases on record demonstrate this circumstance, and Vallisneri informed me that an intimate acquaintance of his at Padua, had been violently affected with most of the symptoms of urinary calculus, and they were so protracted that had there been an obstruction of urine, every physician would have pronounced that a stone occupied the bladder. However, many were of a different opinion because he always voided urine without any difficulty, even when in an erect position. On examining his bladder after death three smooth calculi were discovered; they were of a roundish figure, and when placed near together, a triangular foramen was left between them.

In these cases the calculus might be perceived by the introduction of the catheter, but when calculi are contained in a diverticulum, formed at the side of the bladder, they are imperceptible. Of the origin of these diverticula I shall have a better opportunity of speaking hereafter; an allusion to them now is sufficient to show how much patients themselves, as well as lithotomists, may be deceived, if calculi which before were in the bladder, should recede into a sacculus, from which, according to the position and motion of the patient, they may return into the bladder. It will sometimes happen that out of many lithotomists only one may perceive the stone, and to the same individual it may at one time be perceptible, but not at another. The patient might previously have complained of tenesmus, from the weight of the stone pressing against the subjacent rectum like a quantity of hardened

excrement ; when the bladder was contracted to expel its contents, he might have experienced violent pain from the stone irritating the coats of the bladder ; and he might have suffered occasional obstruction to the discharge of urine from the interposition of the foreign body ; but when the stone has been diverted into a lateral sacculus of the bladder, he is exonerated from all these symptoms, and appears totally relieved from the disease.—10.

CASE 2.

Calculi in the kidneys and bladder ; and calcareous matter in the prostate gland.

Andrew Cortini, the subject of the present case, was rather fat, and sedentary, and when he had passed his sixtieth year, his urine became white and viscid. A surgeon, on introducing a catheter, discovered a stone in the bladder. After the introduction of this instrument he voided urine more easily, and did not complain so much of the inconvenience attendant on this evacuation, as of a pain at the scrobiculus cordis, which compelled him to stop if he attempted to walk a little quicker than usual. This was accompanied with turgid and vibrating pulsations of the arteries, such as frequently happen from aneurism ; nor did these affections cease when, after a long interval, the difficulty of making water returned, with a sense of ardor about the pubis. Indeed, he complained of almost constant pain at the scrobiculus cordis.

Three or four years had elapsed from the commencement of the dysury, and twenty-two months from the beginning of the other unpleasant symptoms, when in February 1711, I was called to the patient, to console him, rather than to cure him, as I immediately said to his domestics.

The quantity of urine he voided greatly exceeded that of the fluids drank. It was of a whitish yellow colour and turbid; and was discharged with difficulty and pain. The pain at the pit of the stomach, at intervals, was extremely violent and gnawing; and at these periods the sternum and adjacent parts were painful also. The left arm became benumbed and insensible, and the heart palpitated to a troublesome degree, especially during decumbence on the left side. Every day these symptoms increased in severity, and the face, instead of being florid during the exacerbations of pain, as it had generally been, became cold. His hands and feet also were cold, and the bowels, which hitherto had required the daily excitement of an enema, became so lax that he passed a bilious dejection after each exacerbation. In proportion as the severity of these paroxysms increased, every symptom of irritation about the bladder was mitigated, and the urine was expelled with greater freedom. There was no hardness or tension of the abdomen. His sleep was interrupted by the painful affections I have described, his appetite was impaired, and he was annoyed with thirst; consequently, his strength failed, his mind became torpid, his pulse sunk, and frequently was unequal, and the feebleness and inequality of pulsation were greatest on the left side. On the eighth of March he died.

Dissection. The body was still rather fat, and the thoracic viscera were healthy. The liver was not of a natural colour, the gall-bladder was contracted and flaccid, and the fundus of the stomach exhibited a slight appearance of blackness.

The interior substance of the left kidney was almost entirely removed, and the remainder was exceedingly flabby, and contained an irregular calculus, with some urine similar to that which had been

voided. Urine having the same appearance was contained in the right kidney, the upper surface of which was divided into a considerable number of prominences like globules of an unequal magnitude.

The bladder contained three calculi which were neither rough nor large. The inner surface of this cavity appeared to be constituted of a fine tomentum; and, at the side of the cervix, a hard tubercle arose, not larger than a bean, and of the same colour throughout as the bladder. There was a sinus in the prostate gland which contained matter resembling tartar, and nearly calculous.

Morgagni, xlii. 13.

The causes of dysury, in this patient, were seated in the prostate gland, the bladder, and kidneys; and the violent pains by which he was so excessively tormented, likewise arose from the kidneys. No practitioner can be ignorant how intimately the stomach sympathizes with those organs; and to this sympathetic influence the vomitings usually attendant upon disorders of the kidneys are ascribable. It is also well known that pain in the stomach is frequently united with renal diseases, but it is not pain which leads to fatal consequences, nor is it usually disjoined from pain in the loins, which generally accompanies the lesions of these viscera. However, in the preceding instance, there was no pain in the loins, no severe pain in the bladder or hypochondria, nor any vomiting; but the intolerable pains in the scrobiculus cordis were the only symptoms of disease in the kidneys.—14.

CASE 3.

Culculus in the bladder; suppuration in the kidneys; ureters dilated.

A young man, who had passed his twentieth year,

had for a long time been afflicted with such pains of the bladder, especially when he made water, that he could not expel his urine without crying out, and the urine itself presented a purulent appearance. Emaciation, fever, and the other affections which usually accompany stone in the bladder, had come on; and, before the close of 1742, he died in this hospital.

Dissection. The bladder contained a calculus which was somewhat rough externally, three digits in length, and two and a half broad; and in some places a large quantity of tough and bloody mucus adhered to it. The coats of this viscus were thickened and ulcerated, and were partially scirrhus. The kidneys and ureters were full of pus and urine; and the ureters were dilated to such a degree as to equal the intestinum ileum in diameter.

Morgagni, xlii. 15.

Mucus, which we saw adhering to the calculus in this instance, sometimes accumulates so abundantly upon these concretions, that, from this cause, they may not be distinguishable even upon introducing the catheter. This circumstance, which has happened to the most experienced men, occurred to Fallopius; and the pain, also, which arises from calculus, becomes mitigated, especially if the adhering mucus is of a thick consistence. On this account, diuretic medicines tend to augment pain. The other symptoms attendant upon stone are not alleviated in consequence of this mucous investment; indeed some of them are increased.—16.

My dissections of persons afflicted with stone certainly have been but few, because it is not a disease of frequent occurrence in this country. The disease is not peculiar to the human subject, for calculi have been found in the bladder of oxen, pigs, dogs, and other animals. In a dog that had been

affected with incontinence of urine for a long time, some thousands of small calculi were found in the distended bladder; and this viscus, in another dog, contained a calculus which weighed a pound and a half. When there have been asperities on the surface of these concretions in dogs, the discharge of urine has been accompanied with violent howlings. Calculi have also been found in the liver, gall-bladder, stomach, and intestines of animals.—17.

Calculi are said to have been voided by one infant two days old, and by another eight days; and in both instances concretions were found in them after death.

Whether an incipient calculus, or the matter of which it is formed, descends from the kidneys into the bladder, or is generated in the bladder itself, undoubtedly the calculus derives its increase from the same matter; and I apprehend that those who maintain that the accretion of these granules will be firm in proportion as the increase is slow, are correct in their opinion.

Besides calculi originating in the kidneys and bladder, the same earthy deposite may adhere to any extraneous body introduced into the bladder. Many examples of this description have been collected by authors, but I shall chiefly describe those observed by myself or by my friends.—18.

The first case that offered itself to me was published in the *Ephemerides Cæsareæ N. C. Academicæ*, forty-three years ago. The incrustation had taken place around a needle. The calculous matter was friable; its texture was spongy; and there were some laminæ towards the surface. In the *Sepulchretum* calculi are spoken of which had a flinty hardness, and even struck fire with steel; and, on the authority of Heers, one is said to have been harder than flint. However, no calculus has ever been exhibited

to me, to which this description was applicable, except when some fraud had been practised. These deceptions have been carried so far, that on one occasion a river pebble smeared with blood, was obtruded upon the incautious for a calculus of the bladder. A physician at Venice, in other respects a well-informed man, transmitted to me the particulars of a woman who he said almost daily voided a considerable number of calculi, and not very small; and with the letter he forwarded a considerable number of the stones in question. I was astonished that an individual existed, who did not discover them to be large and rugged fragments of common flint.

However, calculi generated in the bladder are sometimes extremely hard; and undoubtedly we must believe the celebrated Morand, when he asserts that those which he denominates *murales* take the same polish as marble.

In consequence of observing that when calculi were thrown into a mixture of acids and alkalies, they were either totally or partially dissolved, experiments were made, by injecting effervescing fluids into the bladder of a dog, to ascertain how far the bladder could bear them. But although borne by this viscus when in a healthy state, certainly they would be intolerable to it when irritable and ulcerated from calculi.—19.

CASE 4.

Calculus from deposition on a bodkin.

A country girl, about the same age as the individual alluded to above, had committed similar indiscretion, and the consequences were equally fatal. She died in her fourteenth year, and sixteen months before that event happened, she introduced a brass hair-bodkin, bent in the middle, very high into the

urethra. At that moment she perceived that it was suddenly snatched out of her fingers, and became entirely concealed within the bladder. She experienced much pain, especially at the time of making water, but a consciousness of guilt restrained her from acknowledging the real cause of her sufferings till her decease approached. Swelling arose and occupied the hypogastrium, and the adjacent part of the ileum; and pus escaped by two foramina which had spontaneously formed. The larger opening was in the left iliac region, and the smaller on the right side, in that part designated by Laurentius, *the fines hypogastrii*. In this state she was received into the hospital a month or two before her death; and it was observed that urine issued from the foramina as well as pus, and that there was a space beneath the left, with which the right also communicated. Within this cavity the probe came into contact with something hard, and I immediately recollected what had resisted a similar instrument when introduced through a fistulous opening, discharging urine, in the former girl. Combining this circumstance with the pain in the bladder, I inquired if she had introduced a bodkin, or any extraneous body into the urethra. She denied having done this, till the left foramen was enlarged by a slight division of the common integuments, when the greater part of the bodkin was distinctly visible. Unable any longer to conceal the truth, she confessed what she had done when it was too late. The bodkin could not be extracted on account of a calculus having gathered around it; and though it was easy to perceive the calculus by introducing a probe through the urethra, or through the cavity which has been mentioned, yet it was impossible to move it in the slightest degree without exciting most violent pain. The concretion blocked up the urethra so that nothing

could be injected into the bladder to allay the pain. She became emaciated, the quantity of purulent discharge increased, the fever became extremely violent, and the putrescent odour exceedingly strong. These symptoms were accompanied with a loathing of food, vomiting, and bilious diarrhœa; and the debility was progressive till death terminated the patient's miseries. It is worthy of remark, that she had not been heard to complain of pain in the loins.

Dissection. In the examination of the body I first directed a probe to be passed through the right foramen into the cavity of the ulcer, and the whole sinus to be laid open. It was situated between the abdominal muscles and integuments, and was three digits in length and breadth. It extended from the left ileum towards the linea alba; the posterior parietes were thin, and were constituted of the remainder of the muscles, and of the peritoneum; but through the same parietes, which were open on the right side, it communicated with the fundus of the bladder; and at that point a large extent of the bodkin projected into the cavity of the ulcer. When the abdomen was opened, it was observed that the bladder adhered to the abdominal parietes pretty high above the pubes, so that there had been no effusion of urine into the abdominal cavity; and the lower border of the omentum, which scarcely contained any fat, was closely united with the peritoneal coat of the bladder. The coats of the bladder were thickened, and so contracted that the cavity would scarcely contain any thing except the stone. In many places the inner coat was rough and ulcerated, and in some parts it adhered to the concretion. Like the cavity of the ulcer, too, at several points the inner coats had become gangrenous.

The calculus was a little more than two digits in

length, and somewhat thicker than a man's thumb. It was of an oval figure, and its vertex, with the point of the needle, was turned upwards. It weighed about seven drams.

Some of the intestines were slightly livid, and somewhat turgid with yellowish matter. The liver was white; the spleen was of a rather deep livid colour, and a little enlarged. The ureters were dilated, and full of a purulent fluid mixed with urine, which resembled matter found in considerable quantity in the ulcer. The kidneys were enlarged, especially the right, which also was hard, and excavated into small cells. The cells, as well as the pelvis of this organ, were excessively distended with the same kind of fluid as that contained in the ureters. The capsule and proper coats of the left kidney were united together, were thickened and indurated; and matter resembling that which has been mentioned, pervaded both the interior of this kidney, and also the surface, which was ulcerated in several places. A most offensive odour exhaled from the kidneys and bladder.

Morgagni, xlii. 20.

Occasionally, bodkins said to have passed into the bladder have afterwards fallen out. Two cases are mentioned by Vallisneri, in one of which the bodkin escaped during sleep, and in another it was expelled at the time of making water. Although I suspect that in these instances the bodkins had only partially entered the bladder, I do not intend to deny the possibility of their being discharged when they have been completely admitted into that viscus. Extraneous bodies have remained in the bladder fifteen days, yea, for a month, without being incrustated. The urine in all persons is not equally impregnated with particles suitable for the generation of calculi; some persons retain their urine longer than others; and

there is a diversity also in the composition and surfaces of bodkins. Deposition seems more likely to take place upon a somewhat rough surface, than on one that is polished; and hence, perhaps, we are to account for the circumstance that generally one part of a bodkin is covered with calculous matter, whilst another remains naked.

When a bodkin had been thrust into the bladder, and it had remained there for a long time, and a calculus of a considerable size had formed upon it, I do not recollect to have read of more than a solitary instance of its being successfully extracted. The subject of this favourable issue was a Venetian woman, and the circumstances were published by Molinetti, under whose management the cure was effected in 1649.—21.

The unhappy consequences which result from the retention of these extraneous bodies may be averted, if the fact is disclosed before a deposition of calculous matter has taken place; and sometimes the removal is effected without injuring the bladder. I was present when Vulpius accomplished the extraction of a brass pin, by means of a very smooth iron wire, one extremity of which he had curved nearly into a ring; so, that while no injury could be inflicted on the bladder, it was capable of holding the pin, without suffering the head to slip through.

Should the real state of things be unknown till a much later period, when deposition shall have actually taken place, before the woman is subjected to the tortures of a difficult extraction it is necessary to inquire, not only whether the bladder is diseased, which is naturally suspected, but whether the ureters, and especially the kidneys, have already contracted so much disease, that although the needle and calculus should be removed, death is still inevitable.—22.

The dilatation of the ureters and kidneys in cases of retention of urine, and of the detention of pus, is a fact which has been demonstrated on numerous occasions; and sometimes the same result happens when the bladder is excessively contracted, or when its cavity is filled by some foreign body. Although, in the natural state, nothing can pass from the bladder into the ureters, yet when they become greatly dilated, no part remains to pass obliquely between the coats of the bladder. Therefore, not only may a portion of urine then regurgitate, but even after the retention begins to yield, or is effectually remedied, whenever the bladder contracts to expel urine it will urge more of that secretion upwards, through the expanded orifices, in proportion as its exit through the urethra is impeded. If pus exists in the bladder under these circumstances, that fluid, also, might be urged up the ureters quite to the kidneys; especially if the patient attempt to make water whilst in the horizontal posture.—23.

These occurrences are equally common to males and females. Besides the young man whose case is described,* I might subjoin other instances in addition to those recorded in the *Sepulchretum*. In his treatise *de Abscessu Mesenterii*, Henricus Henrici speaks of a girl five years of age, who was affected with calculus, and in whom one ureter resembled an intestine, and the corresponding kidney was three times the size of the opposite. In an old man afflicted from the same cause, Mauchartus found these canals dilated so as to equal the size of the *intestinum ileum*, and distended with urine resembling buttermilk. The kidneys, at the same time, were very large and unequal, and their pelves were expanded to the extent of an egg. Laubius not only saw the ureters and

* Vide p. 333.

pelves greatly dilated from the same disease, but there was lesion of the kidneys also. One of these organs was affected with atrophy, and the other was large and ulcerated. Lospichlerus found the ureters in a merchant so exceedingly distended with urine as easily to admit a pretty large thumb.

However, it must be acknowledged that not unfrequently the kidneys become diseased, and the ureters dilated, from a calculus, before it arrives at the bladder; but if these lesions have taken place before the calculus falls into the bladder, they will be proportionately augmented by the reflux of purulent urine.

A prudent lithotomist, therefore, will act with great caution, and should he be induced to operate from the solicitude of the patient, he will feel that it is incumbent upon him to give a candid prediction in relation to the organic lesion and the danger which may remain, notwithstanding the successful extraction of the stone. I am aware, however, that some persons have recovered from this operation although the previous symptoms had been extremely unfavourable; and I am not unmindful that after symptoms of disease in the kidney, and the discharge of pus, that part which appeared to have been the seat of an abscess in this organ, has been found completely cicatrized. Cicatrices, too, have been found in the bladder after ulceration produced by a calculus; but certainly, to be guided by circumstances which rarely occur, is very different from being governed by those which happen most frequently.—24.

I am indebted to Mariani for the following case.

CASE 5.

Calculus from deposition on a bodkin ; kidneys suppurated ; bladder sphacelated.

A young country girl had a bone bodkin drawn into the bladder in the same way that a similar accident happened to the individuals already mentioned. Although it excited much pain and uneasiness, yet she made no disclosure till a calculus had formed around the bodkin, when her agonies became intolerable. On examination, the point of the bodkin was found to have perforated the urethra, and to project within the vagina. Mariani conceived that if the urethra were a little slit in the longitudinal direction, the point might be drawn into the urethra, and by scaling away the probably fragile concretion, it might be possible so to reduce its bulk as to extract the bodkin; but this opinion was overruled by other practitioners, so that nothing was attempted, and the girl was abandoned to her miserable destiny. The calculus enlarged, the pain increased, the orifice of the bladder became almost obstructed, so that little urine was discharged, and that was extremely offensive. Fever also came on, and a painful life was terminated.

Dissection. As soon as the abdomen was opened pus was observed in the pelvis, and it was supposed to have escaped from the kidneys, in which supuration had taken place. The bladder was in a state of sphacelation, and contained a pyriform calculus. In one part it was connected to the bladder, and on being removed some squamulæ remained adhering to the inner coat. Nevertheless it weighed eighteen drams. Afterwards, however, when the account was transmitted to me, its weight did not exceed fourteen.—*Morgagni*, xlii. 25.

CASE 6.

A bodkin introduced into the bladder and removed.

Not long after the fatal termination of one of the preceding cases, a surgeon, who had been a pupil of mine, informed me that he had been called to a girl, who, when in a sitting posture, had thrust the head of a bodkin, which was almost as large as the urethra itself, very far into that canal. Being alarmed by the sudden appearance of her mother, she let go the bodkin, and at the same instant it was drawn upwards. For nearly four days she bore the uneasiness in silence, and then confessed to her mother what had happened. When the surgeon was consulted, he supposed, from the seat of a pricking sensation, that the lower part of the bodkin was fixed about the middle of the urethra; and fearing that if an instrument were introduced to extract the body it might be pushed into the bladder, he successively introduced two fingers into the vagina, and moved the needle so far downwards, that its point appeared at the orifice of the urethra, and could be seized by the forceps. The bodkin was four digits long, had a very sharp point, and appeared to be made of tin. A little calculous matter had been deposited upon it.

Morgagni, xlii. 26.

I have no doubt that these occurrences would be found more common if a sense of shame did not induce most women to conceal the true cause of their disease. With a view to deceive the physician, some young females pretend to have swallowed the extraneous body; but credulity is more circumscribed than formerly, at least among the better informed Italians; but of the credulousness of some other

countries I discern pretty evident traces even in excellent books.*—27.

CASE 7.

Calculus, whose nucleus was a bodkin, contained in a diverticulum of the bladder; coats of the bladder ulcerated and thickened.

A countryman, forty years of age, had, for a long time, laboured under great difficulty of making water. He came into the hospital a month before his death, not exclusively because of the dysury, but, in part, on account of ulceration in the scrotum, and fever. Diarrhœa, at first, was combined with the febrile affection, and afterwards constipation. The marasmus daily increased, and ultimately he became emaciated to the utmost extent; his face was cachectic, and, in process of time, he died from the pain in the bladder.

When the period of dissolution drew near, he expressed a desire that the cause of his protracted and troublesome dysury might be investigated by dissection. He therefore acquainted the surgeon, that, two years before, he had introduced a brass hair-bodkin into the urethra, but whether it had fallen out or still remained there he scarcely knew.

Having been informed of this circumstance, I ordered the body to be brought for examination.

Dissection. The scrotum was ulcerated from the dripping of urine, and the coats of the testicles were

* Dr. Molyneux appears to have been aware of this species of misrepresentation. Upon a girl who reported that she had swallowed a bodkin nine weeks before, he performed lithotomy, by the high operation, and removed the extraneous body from the bladder. According to the patient's acknowledgement she felt it in the bladder the day after she had swallowed it, but he suspected that it had been introduced by a more direct channel.

Phil. Trans. abridged, vol. 4.—Ed.

thickened. The urethra was laid open longitudinally, but the inner surface was not in a state of ulceration, nor did any cicatrices or redness appear. It was whitish and smooth, though considerably thickened. The bladder was empty, contracted, and of an irregular figure. For at the upper and right side it protruded into a kind of small pouch, of a square figure; and this process had acquired a blackish hue. The seminal caruncle was shrivelled, but it was furnished with its natural sinus. Immediately above the caruncle, the whole inner surface of the prostate gland, and also that of the bladder, was ulcerated, and covered with a kind of whitish eschar. The coats of the bladder were thickened and almost scirrhus. In some places they were livid and black, and in others white. The sacculus did not present a different appearance, for it not only communicated with the bladder, by an orifice equal in diameter to its whole extent, but the cyst itself consisted of an extension of all the coats of this reservoir. Within this sacculus a calculus was contained the size of a rather small walnut, and it was smeared over with a secretion resembling the white of an egg. From the side of this calculus, near one extremity, the bodkin projected to the extent of two digits; and the remaining part, which appertained to the head, being firmly buried within the calculus, was about equal to the breadth of one finger, or perhaps exceeded it. The point was fixed in the inferior and left side of the contracted bladder.

The orifices of the ureters were much larger than they generally are, and these ducts themselves were so much dilated, and distended with pus, as in some places to equal the thickness of a man's thumb. The kidneys were turgid and greatly enlarged; they were pale externally, but internally they were half putrid, and abounded with pus.

Morgagni, xlii. 23.

The circumstance most extraordinary in this case was, that so long a bodkin should have reached the bladder through the male urethra. There are cases on record of the needles commonly used by semstresses, and other foreign bodies being found in calculi of the male bladder, but they do not seem to have entered by the urethra. In some instances they are known to have been swallowed, and must have penetrated the bladder from the intestines.*
—29.

* Animal chemistry was not very successfully cultivated till within a very few years, and little, comparatively, was known respecting the composition of urinary concretions, till Dr. Wollaston's extremely interesting and important discoveries—discoveries which have been confirmed and amplified by other chemical philosophers.

Dr. Marcet, in his valuable Treatise on the Chemical History and Medical Treatment of Calculous Disorders, divides calculi into the following nine species; of which I shall subjoin an abstract, chiefly derived from Dr. Ure's Dictionary of Chemistry.

Species 1. *Uric acid calculi*. Dr. Henry says, in his instructive paper on urinary and other morbid concretions, read before the Medical Society of London, March 2d, 1819, that it has never yet occurred to him to examine a calculus composed of this acid in a state of absolute purity. They contain about 9-10ths of the pure acid along with urea, and an animal matter which is not gelatine, but of an albuminous nature. This must not, however, be regarded as a cement; the calculus is aggregated by the cohesive attraction of the lithic acid itself. The colour of lithic acid calculi is yellowish or reddish brown, resembling the appearance of wood. They have commonly a smooth polished surface, a lamellar or radiated structure, and consist of fine particles well compacted. The relative frequency of lithic acid calculi will be seen from the following statement. Of 150 examined by Mr. Brande, 16 were composed wholly of this acid, and almost all contained more or less of it. Fourcroy and Vauquelin found it in the greater number of 500, which they analyzed. All those examined by Scheele consisted of it alone; and 300 analyzed by Dr. Pearson contained it in greater or smaller proportion. According to Dr. Henry's experience, it constitutes 10 urinary concretions out of

Sacculi and supernumerary chambers in the bladder.

Some anatomists have attempted to explain the origin of sacculi of the bladder by referring to na-

26, exclusive of the alternating calculi; and Mr. Brande has lately stated, that out of 58 cases of kidney calculi, 51 were lithic acid, 6 oxalic, and 1 cystic.

Species 2. *Ammonia-magnesian phosphate*. This calculus is white like chalk, is friable between the fingers, is often covered with dog-tooth crystals, and contains semi-crystalline layers. It is insoluble in alkalis, but soluble in nitric, muriatic, and acetic acids. According to Dr. Henry, the earthy phosphates, comprehending the second and third species, were, to the whole number of concretions, in the ratio of 10 to 85. Mr. Brande justly observes, in the sixteenth number of his Journal, that the urine has at all times a tendency to deposite the triple phosphate upon any body over which it passes. Hence, drains by which urine is carried off, are often incrustated with its regular crystals; and in cases where extraneous bodies had got into the bladder, they have often, in a very short time, become considerably enlarged by deposition of the same substance. Calculi composed entirely of the ammonia-magnesian phosphate are very rare. Mr. Brande has seen only two. They were crystallized upon the surface, and their fracture was somewhat foliated. In its pure state it is even rare as an incrustation. The powder of the ammonia-phosphate calculus has a brilliant white colour, a faint sweetish taste, and is somewhat soluble in water. Fourcroy and Vauquelin suppose the above deposits to result from incipient putrefaction of urine in the bladder. It is certain that the triple phosphate is copiously precipitated from urine in such circumstances out of the body.

Species 3. *The bone-earth calculus*. Its surface, according to Dr. Wollaston, is generally pale brown, smooth, and when sawed through, it appears of a laminated texture, easily separable into concentric crusts; sometimes, also, each lamina is striated in a direction perpendicular to the surface, as from an assemblage of crystalline needles. Dr. Henry says he has never been able to recognise a calculus of pure phosphate of lime, in any of the collections which he has examined, nor did he ever find the preceding species in a pure state, though a calculus in Mr. White's possession contained more than 90 per cent. of ammonia-magnesian phosphate.

tural conformation; and others attribute them to calculi generated between the coats of the bladder, and gradually enlarging till they form for themselves a cyst; and the inner coats, at length,

Species 4. *The fusible calculus*. This is a very friable concretion of a white colour, resembling chalk in appearance and texture. It often breaks into layers, and exhibits a glittering appearance internally, from intermixture of the crystals of triple phosphate, sp. gravity from 1.14 to 1.47; soluble in dilute, muriatic, and nitric acids, but not in alkaline lixivium; the nucleus is generally lithic acid. In four instances only, out of 187, did Dr. Henry find the calculus composed, throughout, of the earthy phosphates.

Species 5. *The mulberry calculus*. Its surface is rough and tuberculated, and colour deep reddish brown. Sometimes it is pale brown, of a crystalline texture, and covered with flat octohedral crystals. This calculus has commonly the density and hardness of ivory; a sp. gravity from 1.4 to 1.98; and when sawed exhales the odour of semen. A moderate red heat converts it into carbonate of lime; it does not dissolve in alkaline lixivium; but slowly, and with difficulty, in acids. When the oxalate of lime is voided directly after leaving the kidneys, it is of a greyish brown colour, composed of small cohering spherules, sometimes with a polished surface resembling hempseed. They are easily recognised by their insolubility in muriatic acid, and their swelling up and passing into pure lime before the blowpipe. Mulberry calculi contain always an admixture of other substances besides oxalate of lime. These are, uric acid, phosphate of lime, and animal matter in dark flocculi. The colouring matter of these calculi is probably effused blood. Dr. Henry rates the frequency of this species at 1 in 17 of the whole which he has compared; and out of 127 calculi he found that 17 were formed round nuclei of oxalate of lime. Persons who have voided this species of concretion are supposed to be less liable to a return of the complaint than those who are subject to lithic calculus.

Species 6. *The cystic oxide calculus*. It resembles a little the triple phosphate, or, more exactly, magnesian limestone. It is somewhat tough when cut, and has a peculiar greasy lustre; its usual colour is pale brown, bordering on straw yellow, and its texture is irregularly crystalline. This concretion is of very rare occurrence. Dr. Henry states its frequency to the whole as 10 to 985. In two which he examined the nucleus was the same substance as the rest of the concretion; and in a

rupturing or ulcerating, the calculus communicates with the bladder.

third the nucleus of a uric acid calculus was a small spherule of cystic oxide. Hence, as Dr. Marcet has remarked, this oxide appears to be, in reality, the production of the kidneys, and is not generated in the bladder, as its name would import. It might be called, with propriety, renal oxide, if its eminent discoverer should think fit.

Species 7. *The alternating calculus.* The surface of this calculus is usually white, like chalk, and friable or semi-crystalline, according as the exterior coat is the calcareous or ammoni-magnesian phosphate. They are frequently of a large size, and contain a nucleus of lithic acid. Sometimes the two phosphates form alternate layers round the nucleus. The above are the most common alternating calculi; next are those of oxalate of lime with phosphates; then oxalate of lime with lithic acid; and lastly, those in which the three substances alternate. The alternating taken all together occur in 10 out of 25 in Dr. Henry's list. The lithic acid with phosphates as 10 to 48. The oxalate of lime with phosphates as 10 to 116. The oxalate of lime with lithic acid as 10 to 170. The oxalate of lime with lithic acid and phosphates as 10 to 265. These calculi, and the following, indicate that occasional changes in the body can produce a total change in the nature of the urinary secretions, and similar changes medicines may probably effect.

Species 8. *The compound calculus.* This consists of a mixture of lithic acid with the phosphates in variable proportions, and is consequently variable in its appearance. Sometimes the alternating layers are so thin as to be undistinguishable by the eye, when their nature can only be determined by chemical analysis. This species in Dr. Henry's list forms 10 in 235. About 1-40th of the calculi examined by Fourcroy and Vauquelin were compound calculi from the prostate gland.

Species 9. *Calculi from the prostate gland.* These have already been described.*

To the above, Dr. Marcet has added two new sub-species. The first seems to bear some resemblance to the cystic oxide, but it possesses also some marks of distinction. It forms a bright lemon-yellow residuum on evaporating its nitric acid solution, and is composed of laminæ. But the cystic oxide is not laminated, and it leaves a white residuum from the nitric acid solution. Though they are both soluble in acids as well as alkalis, yet the oxide is more so in acids than the new calculus, which has been called by Dr. Marcet, from its yellow residuum, *xanthic*

* Vide page 317.

I am not entirely repugnant to these two methods of accounting for sacculi in particular cases, but we cannot admit them in all. Not only are other observations which I have related opposed to such opinions, but the preceding instance is remarkably so. In the *Adversaria* is related the case of a drunkard in whom sacculi existed. Some were completely formed, and others were in an incipient state; but all of them appeared to have commenced in the interstices of the muscular fibres, where the coats pro-

oxide. His other new calculus was found to possess the properties of the fibrine of the blood, of which it seems to be a deposit; he terms it *fibrinous* calculus.

In almost all calculi a central nucleus may be discovered, sufficiently small to have descended through the ureters into the bladder. The disease of stone is to be considered, therefore, essentially and originally as belonging to the kidneys. Its increase in the bladder may be occasioned either by exposure to urine that contains an excess of the same ingredient as that composing the nucleus, in which case it will be uniformly constituted throughout; or if the morbid nucleus deposite should cease, the concretion will then acquire a coating of the earthy phosphates. It becomes, therefore, highly important, to ascertain the nature of the most predominant nucleus. Out of 187 calculi examined by Dr. Henry, 17 were formed round nuclei of oxalate of lime, three round nuclei of cystic oxide, four round nuclei of the earthy phosphates, two round extraneous substances, and in three the nucleus was replaced by a small cavity, occasioned, probably, by the shrinking of some animal matter round which the ingredients of the calculi (fusible) had been deposited. Rau has shown, by experiment, that pus may form the nucleus of a urinary concretion. The remaining 158 calculi of Dr. Henry's list had central nuclei composed chiefly of lithic acid. It appears, also, that in a very great majority of the cases referred to by him, the disposition to secrete an excess of lithic acid has been the essential cause of the origin of stone. Hence it becomes a matter of great importance to inquire what are the circumstances that contribute to its redundant production, and to ascertain by what plan of diet and medicine this morbid action of the kidneys may best be obviated or removed. A calculus in Mr. White's collection had for its nucleus a fragment of a bougie that had slipped into the bladder. It belonged to the fusible species.—*Ed.*

truded. Who could imagine that the sacculus in the countryman was a natural production, and had not arisen from frequent retention of urine? These sacculi are often found where there are no calculi. I have never met with an instance in which the inner coat was ruptured, but in all of them this coat was relaxed and expanded.—30.

These sacculi differ from those which are formed by calculi lodging at the narrow orifices of the ureters, and enlarging them, as Petrus Francus and others have witnessed; and Littre found them near the cervix vesicæ, having a passage of communication with the ureter, from the extremity of which they had descended between the coats of the bladder.

A case is related on the authority of Tulpius, in which thirty-nine calculi were found in the bladder, each in its proper receptacle: and Holtzappelius speaks of thirty-two calculi, all included in their proper coats, and contiguous to each other. So that these calculi, each in its little cell, filled the cavity of the bladder, (as bees, in their small caverns, fill the honey-comb,) leaving only a small channel for the urine.—31.

Sacculi have been found at all parts of the bladder, and it is highly important that the lithotomist should bear them in recollection. Many have been deceived, and have supposed individuals cured of calculi because they could no longer be detected by the sound. But besides the uncertainty of success in searching for the stone when, at one time it is in the bladder, and at another in the sacculus, it may sometimes happen that the calculus, which was evidently perceived in the bladder some days before, may be sought for in vain, when an incision is made into that cavity. Should this occur, it will, of course, be greatly detrimental to the patient, and extremely

injurious to the surgeon's reputation. Therefore, he ought never to commence his operation without feeling the stone in the cavity of the bladder at the very time. The calculus varies its situation when the orifice of the sacculus is pretty large in proportion to the bulk of the calculus, as was the case in the rustic spoken of above.*

By the progressive enlargement of the calculus, and the detention of urine in the sac, the coats which constitute that diverticulum may be so extended that its expulsive powers become increasingly impaired, and this protruded part may expand to such a degree as to be mistaken for another bladder. I do not make this remark without being aware that, on some occasions, the bladder has unquestionably been double from original formation; for I know that it has not only been double, but also three-fold, and even five-fold. Molinetti publicly demonstrated five in the body of a woman, who was likewise furnished with as many kidneys, and six ureters. Two of these canals were inserted into the larger bladder, and the remainder into four smaller vesicæ. These bladders discharged their urine into the larger chamber by peculiar tubuli. So far as I recollect, Molinetti refers to no other person except Fantonus, who, besides himself, had witnessed this quintuple or five-fold bladder.

Sometimes the bladder is divided by a preternatural septum placed longitudinally or transversely. It has usually been observed in quadrupeds, and the second chamber appears to have belonged to the dilated urachus. Blasius met with an instance of a very small septum, but another instance mentioned by him, was rather a junction of two bladders than one divided by a septum. In a case related by Coi-

* Vide page 345.

terus, it appears that a large hydatid which was attached to the bladder, led to a suspicion that the bladder was double. However, where there is an appearance of two or more bladders which communicate with each other, and yet, from their precise structure—for instance, from the want of ureter—they do not appear to have existed from original formation, I should suspect it to be a hernia of the natural bladder, formed from disease, by a protrusion of the inner membrane between the fasciculi of fibres; and this opinion would be sanctioned if there were a calculus in the bladder, or if strangury, disury, or frequent retention of urine had preceded.—32.

Ellerus met with an instance in which a calculus existed between the coats of the bladder.—lxv. 14.

In a man seen by Hottinger, an acrid secretion from ulcerated kidneys flowing into the bladder, produced constant pain in that viscus, and all the symptoms of calculus; and Hottinger entertained no doubt that a calculus existed. However, after death, no trace of such a body was discovered.—xlii. 4.

Gonorrhœa.

Few anatomists, perhaps, have dissected, and attentively examined, so many male urethræ as myself; yet either morbid appearances after the contagious gonorrhœa are much more uncommon than has generally been supposed, or, from some extraordinary fatality, it has happened, that notwithstanding the great number of persons affected with this disease, I scarcely ever discovered those evident marks of lesion which have been mentioned: and if Valsalva was more successful, he has not recorded it.

In describing the changes which others have witnessed, and those which I have seen myself, I shall

commence from the external orifice of the urethra, and proceed internally to the bladder.

Morgagni, xlv. 1.

In the *Adversaria* I assigned reasons for considering gonorrhœa to be primarily seated in the larger canaliculi which I had discovered in the urethra; and these ducts being irritated, that secretion results which generally distils from the urethra in the first stage. I have often been assured by patients themselves, that at this period of the disease there is no troublesome sensation about the perineum; and this immunity shows that the disorder has not descended any deeper than the part to which I have alluded. The discharge is not genuine pus, as the pain is not of that nature which indicates ulceration, nor does any tinge of blood yet appear.* Senac observed that the globules of the gonorrhœal matter are very large, but those which constitute the pus of ulcers are very small and unequal, and if both eyes, assisted with powerful glasses, are directed to them, they are found to resemble the globules of blood. Following *Rondelet*, therefore, who said that this matter *resembled* pus, I have called it *puriform*.

Amongst others, *Boerhaave* and *Haller* acknowledged the canaliculi to be the seat of the first species of gonorrhœa, and as these ducts have only a membranous separation from the corpus spongiosum urethræ, inflammation, at length, is changed into ulceration, and hæmorrhage frequently ensues. I have found these canaliculi in the urethra of women, and also sebacious glands in the nymphæ and labia pudendi, but I will not speak of them here, as I never

* *Morgagni* does not appear to have recollected that pus might be secreted by an inflamed surface independently of ulceration; nevertheless, he very properly establishes a difference between the specific discharge from the inflamed urethra in gonorrhœa virulenta, and the purulent secretion of an ulcer.—*Ed.*

met with females who were affected with gonorrhœa at the time of death.—2.

CASE. 1.

On examining the body of a man who died from laryngitis, when he had been affected with gonorrhœa about twenty days, I found nothing very remarkable in the canaliculi, but the inner surface of the urethra was somewhat moister and redder than usual. One of Cowper's glands was wanting, which is not a very rare occurrence; and the substance of the other was converted into a hard and firm body resembling ligament.—*Morgagni*, xliv. 3.

Nothing related to the gonorrhœa in this case except the increased secretion in the ducts, and the inflammation of the urethra.—4.

CASE 2.

A young man, twenty-five years of age, and whose countenance was yellow had, for a long time been afflicted with virulent gonorrhœa; and six months before his decease he renewed the infection. Whilst under this disease, he lost so much blood by repeated hæmorrhages from a deep wound of the neck, that he died. This event occurred in the beginning of 1740.

Dissection. The body was almost exsanguis. The lateral ventricles of the brain contained a little fluid, which was rather turbid. The liver was indurated, and the spleen enlarged. On inspecting the præputium, the glans, and the whole urethra, very carefully, I found no ulceration, redness, or any thing which related to the gonorrhœa existing when the man died, except that, from the middle of the urethra to the glans, the canal was unusually moist. But it is probable that the appearances I am about to describe arose from the first and pro-

tracted gonorrhœal affection. Nearly from the place where the humidity commenced, an oblong whitish line was prominent, tending obliquely towards the back part of the urethra. I have already adverted to this appearance, and considered it the remains of a fleshy excrescence. One of the seminal orifices was obliterated, and the other was so narrow that I could scarcely introduce a bristle. The vesiculæ seminales were so much contracted, that we supposed them incapable of containing any thing. There was no trace of Cowper's glands, but they might have been originally wanting. None of my canaliculi were visible except one, which was narrow and short; therefore I accounted for the moisture principally from those very small ducts which were known previous to my discovery of others.—*Morgagni*, xlv. 7.

Having so many times heard patients complain of a very severe pain within the glans, I have often been surprised not to find ulceration, which *Vesalius* and others described as affecting the lacunæ in this part. In some persons the pain has been so excruciating that they have resolved not to make water unless some expedient could be devised to abate their sufferings. I have met the wishes of these patients, not only by diminishing the acrimony of the urine as much as possible, but also by instructing them to immerse the penis in warm milk. After the pain has been mitigated in some measure, I advise them to let the urine flow without impetus, while the penis remains immersed. The pain and swelling have been removed in a single day, by keeping the glans in this fomentation.—8.

The disappearance of the canaliculi probably resulted from inflammation, ulceration, and the adhesion of their thin membranous parietes. When all these larger ducts are obliterated, there must be a

deficiency of the lubricating secretion, by which the urethra is defended from the acrimony of the urine; so that the patient will become more liable to a sensation of ardor from the stimulus of that fluid, and be more exposed to ulceration.—9.

In the body of a man who had been afflicted with asthma, the urethra, at a digit and half from the external orifice, was found contracted and uneven, and continued in this state through the space of three digits, and clearly indicated previous ulceration. On that surface where the canaliculi are situated, we observed three or four whitish and almost tendinous little cords, which passed transversely, but were not very prominent, nor were they detached from the inner coat. There were interstices between these filaments; and for about two digit in the middle of the space occupied by them, the urethra was nearly one half narrower than either above or below.

The appearance which has been described presented itself within the region of the small ducts, which, at first sight, appeared natural, but when attentively examined, it was evident that they had undergone a degree of lesion, though less than the adjacent part of the urethra.—10.

Very rarely Cowper's glands are the seat of gonorrhœal inflammation. Littre dissected forty urethræ which had been affected with this disease, but only in one was there any deviation from the natural structure of these glands; and therefore I am less surprised at having never met with a similar occurrence. I have, indeed, seen in them what appeared to be traces of the previous existence of this disease. One or both of the glands in question have been converted into a hard substance; and, after inflammation, glandular structures often become indurated. In their ducts I have not only met with indications

of inflammation, but also of ulceration. These remarks will be somewhat exemplified by the following case.—11.

CASE 3.

A young man died in the hospital about the middle of April 1713, in consequence of a blow upon his head. I carefully dissected the organs of generation.

Dissection. There was a hollow cicatrix upon the glans penis, but the prostate gland, Littre's gland, and the seminal caruncle, were in a natural state. When I had opened the remainder of the urethra I observed that some of my canaliculi were destroyed. The orifices of none of them, at a greater distance than about four digits from the orifice of the urethra, were apparent. Examining every thing very carefully, my attention was arrested by the appearance presented by the ducts of Cowper's glands. The right was more slender than usual, and the left was enlarged. Into the smaller duct I was unable to introduce any thing, so that I supposed the parietes had either coalesced from inflammation, or were contracted to the utmost degree. The left was distended by a yellowish mucous secretion, and appeared as if it would admit a pretty large probe—and, indeed, it did admit one from the part next the gland, but the opposite extremity, that opened in the urethra, had a very narrow and obscure termination.—*Morgagni*, xliv. 12.

Littre and Cowper saw an ulcer at the orifices of these ducts: and Terraneus found the orifice obstructed, and the duct surprisingly dilated in consequence.—13.

Proceeding from those orifices farther into the urethra, we come to the second of the two places at

which Vesalius remarked that all who are affected with gonorrhœa feel excruciating pain. This situation corresponds with the lowermost part of the perineum, and there, in consequence of the flexure of the canal, the secreted humour accumulates, and irritates the membrane more than in any other part. These patients not only complain when the parts are distended during erection, but they also experience an uneasy sensation in the same place, when it is compressed by the muscles to expel the last drops of urine. The gland of Littre surrounds this place, and there I suppose the urethra occasionally ulcerates, as I have sometimes observed those lines which I consider as cicatrices; and Terraneus found ulcers at that point after protracted gonorrhœa. This, however, happens only occasionally, for, in general, I believe irritation and inflammation are sufficient to account for the sensations which Vesalius has described.—14.

CASE 4.

Syphilis; gonorrhœa; hydatids in the ureters; redness of the bulb of the urethra.

A decrepit old man, who for many years had been severely afflicted with lues venerea, so that his speech was scarcely intelligible, and during the last twelve years of his life he had laboured under a difficulty of making water, and gonorrhœa. Under these affections, and by advancing age, he was gradually worn out, and died in January 1717.

Dissection. The uvula, (part of which was wanting,) the upper and posterior surface of the tongue, and the epiglottis, were covered with cicatrices. The cartilage, therefore, was unequally contracted, and terminated nearly in a triangular vertex. The

disease had extended into the remainder of the larynx, and the adjacent part of the trachea. One of the arytaenoid cartilages appeared to be displaced, and, within the trachea, large and irregular fasciculi of fibres projected.

In the groins there were evident cicatrices from buboes. The kidneys were very small, and were uneven on their surfaces, owing to hemispherical protuberances. Their substance was more compact than usual, and the pelvis of one of them contained a little turbid serum. The ureters were greatly dilated, and the inner surface was of a red colour quite to the kidneys, but the degree of both these marks of disease decreased in proportion as the tubes ascended. About the middle of the right ureter, the inner coat protuberated, and doubled itself, so as to constitute a kind of annular valve of moderate height, and directed against the current of urine. Both these tubes were half full of mucus, and on the inner surface, from the middle upwards, there was an appearance which resembled spherical drops, of various sizes. They did not admit of being wiped away with the sponge; but by compressing them between my finger and the scalpel they were reduced to a kind of viscid matter, tinged with a very faint colour of tobacco. After I had discovered hydatids attached to the same membrane in another case, I supposed these globules were of that nature.

The coats of the bladder were thickened, and throughout its inner surface strong fasciculi of fibres, united by various kinds of entanglement, were visible. This viscus was inundated with a white turbid secretion.

One side of the corona glandis had formerly been destroyed by an ulcer, but, in the course of the urethra scarcely any thing worthy of notice presented itself between the outer orifice and the bulb.

This part, however, was covered with enlarged blood-vessels; so that, instead of exhibiting its usual blackness, it was of a red colour. The prostate gland exhibited three very short and superficial sinuses, which, from an expanded orifice, contracted into the form of a cone. They were situated between the seminal caruncle and the orifice of the bladder.—*Morgagni*, xliv. 15.

This was the only instance in which I saw the urethra in the perineum thus affected. The lodgement of urine there, from the decrepitude of age, may have contributed to induce this vascular plethora.—16.

The last seat of gonorrhœa is the prostate gland and the seminal caruncle. By his own inspections Littre has demonstrated the three situations of this malady to which I have adverted, and has shown that it may exist in either, without implicating the other two. Although we admit the truth of this statement, it cannot be denied that in most of those individuals who, for a long time, have been affected with virulent gonorrhœa, disease has been found in the prostate gland and caruncle. Wharton observed that the small excretory foramina of the prostate, which, in the healthy state, are inconspicuous, become very distinguishable. Bartholin and others found the gland ulcerated, and containing an abscess, after gonorrhœa; and, subsequent to the termination of this disease, a cicatrix has been seen in the gland, or it has been enlarged.

Many instances of ulceration in the caruncle might be adduced, and this body is so small, that if an ulcer forms upon it, the erosion of one or both of the orifices of the seminal ducts is almost inevitable.—17.

CASE 5.

Cell in the prostate gland.

In the year 1742 I dissected the body of an old man concerning whose history I could obtain no information.

Dissection. The heart was enlarged, and its parietes were thickened. There were numerous white spots in the aorta. The convex surface of the liver adhered to the diaphragm, and the spleen exceeded its usual bulk. The kidneys were elongated, and the coats of the bladder greatly thickened. The prostate gland, at its anterior part, exhibited a cavity within its substance, the figure and extent of a moderate-sized grape. The parietes of this cell were of the same colour as the remainder of the gland, and appeared to be invested with a thin membrane, like the follicle of a tumour; but nothing was contained within these parietes.—*Morgagni*, xliv. 19.

It was not clear what had occupied this cavity, but from some analogy to a case which will be communicated under the subject of fever, a question arose, whether it might not have contained granules of matter like tobacco. This matter has been already mentioned—probably it is secreted by the prostate, and afterwards concreted.

Though but little acquainted with the diseases under which the patients had laboured, I shall subjoin two other cases, because I think that the notice of pathological facts, even under these circumstances, is not without its advantages.—20.

CASE 6.

Granules resembling tobacco in the urethra.

The body of a man fifty-four years of age, and who died of apoplexy in 1728, presented the following morbid appearances.

Dissection. The intestines were flaccid, and slightly inflamed. In a spot at the distance of two digits below the pylorus, the inner coat of the intestine was wanting, and an orifice capable of admitting a finger was formed; and when a finger was introduced within it, the outer coat was protruded into a kind of diverticulum, but there was no appearance of ulceration. The spleen was very small, and the coats of the abdominal aorta exhibited some bony lamellæ. The urinary bladder was smaller than it ought to have been; but nothing particular was observed in the urethra except granules of matter resembling tobacco.

Morgagni, xliv. 21.

CASE 7.

The man to whom this case refers was somewhat younger than the former.

Dissection. At the sides of the seminal caruncle there were granules similar to those which have been mentioned. Some of them were dissolved, probably by the moisture of the part, and had imparted a yellow tinge to the orifices of the seminal ducts, and the adjacent parts. These orifices also were rather dilated.—*Morgagni*, xliv. 22.

I am quite aware that gonorrhœas have been ascribed to other parts, as the vesiculæ seminales, the testes, the bladder, the kidneys, and even the ovaria. Some of these organs may be affected by the absorption of venereal virus, and others by the suppression of gonorrhœal discharge, in consequence of the improper employment of astringents; and the testicles frequently suffer from this cause. The irritation and inflammation are augmented, and propagated from the upper part of the urethra, and the adjoining vesicles, by the vasa deferentia, to the testicles.—24. 26.

The passage from the urethra to the kidneys is considerably more distant than to the testicles; and yet Dodonæus affirms that the disease, if greatly protracted, may affect the bladder and ureters, and, in process of time, even the kidneys themselves. In the case related by this author, the gonorrhœa is said to have continued eighteen years. But the kidneys may become diseased by prolonged and repeated gonorrhœal affections, independently of the bladder. This fact has been clearly demonstrated by a case related on the authority of Valsalva.*

However, although the organs referred to may certainly become diseased under these circumstances, I cannot, merely on that account, consider them as the seat of gonorrhœa.—27.

In many of the preceding articles, various changes of structure which followed syphilis have been distinctly mentioned. These were not only manifested in the genital organs, but also in the membranes and structure of the brain; in the throat; the cartilages of the larynx and trachea; the aorta, and valves of the heart; the lungs, and most other viscera; and also in the bones.

In persons who had undergone severe forms of syphilis, and in whom it had continued for a long period, we have found the kidneys, lungs, and aorta more frequently diseased than is usually supposed. I do not remember to have found hepatic lesion in such persons, although it has been supposed that the disease may arise from derangements in the liver.†

Morgagni, lviii.

* Vide page 268.

† Though Morgagni's pathology of gonorrhœa does not exhibit the same precision which characterized the inquiries of John Hunter, yet there is little or no contrariety as to facts. By examining the urethra in malefactors who were known to be affected with gonorrhœa, Hunter demonstrated that ulceration was by no

Malformations in the penis.

Sometimes the urethra opens at the root of the penis, but the procreative faculty does not appear

means necessary to account for the symptoms. From the application of the venereal poison, the surface of the urethra becomes the seat of inflammation of a specific character, it swells, and suppurates, and is often affected with spasmodic contraction. There is considerable fulness of the penis, and hæmorrhage sometimes takes place from the distended vessels. Small swellings often occur along the lower surface of the penis, in the course of the urethra. These Mr. Hunter supposed to be enlarged glands of the passage. They occasionally suppurate, and generally burst outwardly, though sometimes into the urethra. But he also suspected such tumours to be ducts or lacunæ of the glands of the urethra distended with mucus, in consequence of the mouth of the duct being closed, so as to induce inflammation, suppuration, and ulceration. This I apprehend is according with Morgagni's opinion respecting the state of the larger canaliculi he has described. In the situation of Cowper's glands, Mr. Hunter has also distinguished hardness and swelling, which have sometimes terminated in considerable abscesses in the perineum. The latter swellings burst either externally or internally, and sometimes in both directions, so as to produce fistulæ in perineo.

The discharge takes place from the lining membrane, and from the lacunæ, but, in general, it is limited to about two or three inches from the external orifice. Whenever Mr. Hunter had an opportunity of examining the urethra affected with gonorrhœa, he always found the lacunæ loaded with matter, and more visible than in the natural state.

When the inflammation descends deeper than the membranous lining, and affects the reticular membrane of the urethra, it produces in it the effusion of coagulable lymph, by which it has been supposed that chordee is occasioned.

Not unfrequently a sympathetic uneasiness or inflammation arises in many of the adjacent parts within the pelvis, and also the scrotum, testicles, perineum, anus, and hips; and sometimes there is a considerable degree of constitutional disturbance.

Syphilis is a disease so important and protei-form that even an abstract of pathological facts relating to it, would form an article too long for the present work. At first it is a local affection, and, as it is generally contracted by sexual intercourse, it usually commences on the organs of generation; but the appli-

to be necessarily lost, unless the remainder of this canal, to the extremity of the penis, is obliterated. A case has been mentioned in which, although the orifice was not prominent from the scrotum when the parts were unexcited, yet when erection took place the opening appears to have been admitted within the vagina. From this opening the urethra had no posterior parietes even to the extremity of the glans, but during coitus the semen passed along this semi-canal.

In those men in whom the urethra opened beneath the glans, the ancient physicians and surgeons predicted that the generative power was wanting ; but Fabricius affirms that he had seen the offspring of men thus circumstanced—and this statement has been corroborated by others.—*Morgagni*, xlv. 8.

A young man was submitted to my inspection in whom the urethra opened a little above the scrotum, but a long semi-canal, having no posterior parietes, was continued on to the extremity of the glans. There was reason to believe that this man had effected impregnation. In another case, this malformation existed, and was accompanied with an inability to perform the venereal act, in consequence of the glans not becoming turgid during erection.—9.

The urethra has opened upon the dorsum penis. In a case of this description, where the glans was

cation of venereal matter to any other part is equally liable to produce a chancre, and all its loathsome consequences. When the constitution becomes contaminated there are particular textures on which it manifests itself earlier than on others. The *first order of parts*, or those which become affected in the early stage of lues venerea, are the skin, tonsils, nose, throat, inside of the mouth, and sometimes the tongue. The *second order of parts*, or those which are affected at a later period, are the periosteum, fasciæ, and bones. Mr. Hunter believed that the brain, heart, stomach, liver, kidneys, and several other viscera, had never been known to be attacked with the venereal disease.—*Ed.*

imperforate, the man was brought before a magistrate to make provision for an illegitimate child, and he actually settled money on the mother.

Morgagni, lxxvii. 6.

There are other circumstances in which the corpus spongiosum urethræ and the glans may be tense and tumid, while the corpora cavernosa penis remain flaccid, or are wanting; and, on the contrary, the glans may remain flaccid while the corpora cavernosa are distended; and, in either case, the faculty of generation will be impaired. The impediments to distention are as numerous and various as the causes by which the distention of these parts is effected.—xlvi. 10.

SECTION III.

DISEASES IN THE VESICULÆ SEMINALES AND THE SEMINAL DUCTS.

One of the vesiculæ seminales scirrhouis.

A man died in this hospital about the end of November 1717, and on dissecting the body for anatomical purposes, I observed that some parts were in an unnatural condition.

Dissection. The ureters, in some places, were dilated. The parietes of one of the vesiculæ seminales, and of the adjacent part of the corresponding vas deferens, were in a scirrhouis state. The membranous substance had nearly acquired the nature of cartilage.—*Morgagni*, xlvi. 5.

It is apparent how unsuitable these parts were for the perfection of the semen, and for its ejacula-

tion: and although there was nothing unnatural on the other side, yet the hardness and thickening of one seminal duct, at its termination, may gradually extend so as to compress and obstruct the other.

I adopted this opinion to explain phenomena which occurred in the person of a young gentleman of rank, relative to whom I was consulted in 1736. This individual was married and had one daughter. After this period he perceived a swelling in the left spermatic vessels, accompanied with pain and swelling of the epididymis and vas deferens, both of which were hard, whilst the testicle preserved its usual degree of softness. The measures resorted to greatly relieved the pain, but the swelling and hardness were not much reduced. As far as we could ascertain, every thing was healthy on the right side, yet there was no emission of semen in coitu.

Brunnerus and Waltherus have related instances of the cohesion of the parietes of one of the vasa deferentia. Valentinus, as well as others, have recorded instances in which there was a calculus in one of the seminal vesicles.—6.

I have already mentioned having found the seminal vesicles shrunk, even in the body of a young man; and also, the seminal duct perfectly closed at its termination in the urethra.—7.

SECTION IV.

DISEASES OF THE TESTICLE AND SPERMATIC CHORD.

Hydrocele.

Both Malpighi and Valsalva entertained the opinion that a little moisture is naturally secreted by the

tunica vaginalis, and that this fluid, in the form of dew, lubricates the surfaces of that membrane, and of the tunica albuginea, and prevents their coalition: and if this fluid becomes redundant from disease, it constitutes hydrocele. However, I do not allude to these opinions from an idea that hydroceles are to be exclusively accounted for in this way. Indeed, when I attentively review all my observations in reference to this disease, I find none which does not appear to have originated from ruptured hydatids. In each of them some hydatids were still remaining, either in a perfect state or half lacerated; or some traces of them were visible.

Hydatids are sometimes found within the tunica vaginalis, even when no effusion has commenced; but if they burst, and afterwards continue to secrete fluid, undoubtedly they must produce hydrocele. I have already related a case,* in which there was an hydatid on each testicle, and both of them were large. The contained fluid did not coagulate on the fire, but evaporated, leaving only a thin pellicle—exactly as it occurred to Malpighi and Valsalva in examining the water of hydrocele.

Morgagni, xliii. 16.

CASE 1.

Hydrocele from hydatids; hydrothorax and hydrops pericardii; pericardium thickened; and the heart enlarged.

An old gibbous soldier was brought into the hospital, and dying soon afterwards, it was impossible to ascertain what diseases he had been afflicted with except by dissection.

Dissection. Both cavities of the thorax and the pericardium, contained a considerable quantity of water. One lobe of the lungs adhered to the costal

* See vol. 1, p. 61.

pleura, the bronchial glands were enlarged, and one was of a considerable size.

The pericardium was thickened, and a thick and almost puriform matter, which had been separated from the effused fluid, adhered to its inner membrane, and to the surface of the heart; where it presented an appearance resembling slight erosion of the fat. Bearing in recollection, however, what I had formerly observed, I did not allow myself to be deceived by this appearance. The heart was somewhat enlarged, the valves of the aorta were expanded, and that vessel, near the heart, as well as its branches the carotids and subclavians, was dilated. In the coats of these arteries, and likewise in the brachial, there were bony laminæ.

Seven or eight of the upper dorsal vertebræ were so placed, that the spine being curved, and inflected to one side, as many of the ribs of the same side projected backwards, and occasioned gibbosity.

The left side of the scrotum was tumid. Beneath the thickened tunica erythroides and tunica vaginalis, and within the enlarged cavity of the latter coat, I found a serous fluid, of a yellowish brown colour. The testis appeared elongated rather than thickened, and the epididymis was unquestionably longer than it naturally is. I observed a small fimbriated substance hanging from the albuginea where it invested the testicle, very near the larger globe of the epididymis; and this *fimbria* I considered the relic of a ruptured hydatid, especially as, not far from it, an entire hydatid protuberated from the same coat.

Morgagni, xliiii. 17.

CASE 2.

Hydrocele from hydatids ; tubercles of the tunica albuginea testis.

In one of the male bodies which I dissected at Padua in November 1718, one side of the scrotum was tumid.

Dissection. Between the tunica vaginalis and albuginea, on that side, I found a small quantity of serous fluid, the colour of urine. The albuginea was rugged from very small tubercles, and, in consequence of observing some hydatids in the same coat, which had not quite burst, I was led to suppose that the tubercles were the remains of hydatids.

Morgagni, xliii. 13.

CASE 3.

Hydrocele ; a solitary hydatid.

Another male body among those dissected in the spring of 1703, had a hydrocele of a moderate size.

Dissection. The same tunics contained a fluid resembling water in which fresh meat has been washed ; and from the larger globe of the epididymis a small hydatid hung by a slender and short peduncle ; and a small blood-vessel could be perceived passing through it.—*Morgagni*, xliii. 19.

The quantity of fluid being but inconsiderable, may be accounted for from the circumstance that all the hydatids had not burst, and those which had were of a small size, and had not continued to discharge fluid long after their rupture. Combining the remarks already made on the subject of hyda-

tids, with these cases, they tend to elucidate each other.

I have related the dissection of a butcher,* in whom I found a yellowish fluid within each tunica vaginalis, and supposed that the hydatid, on each side, had recently poured out fluid. The residue appeared like vesicles constituted of thick parietes, and contracted so as to become nearly solid. They were of a fleshy colour, and pendulous from the albuginea.—21.

CASE 4.

Hydrocele ; diseased thoracic and abdominal viscera ; pallidness of the bulb of the urethra.

A herdsman died in this hospital in January 1743.

Dissection. The lungs adhered closely to the costal pleura, the heart was enlarged, and the aorta, where beginning to descend, exhibited a bony scale. The carotid arteries were much broader than usual, and the internal jugular veins were extremely wide, especially the right, which was turgid with air, and as thick as a man's thumb.

The descending colon was dilated with gas, and so displaced that the curved part was in the umbilical region. The stomach was excessively large and flabby, and contained numerous lumbrici: for some extent, on the left side, and at the posterior surface of the fundus, the inner coat was wanting; and at the part near the pylorus, gangrene appeared to have commenced. The spleen was greatly enlarged. One half of the inner substance of the liver was partially colourless, and the other was of a pale

* See vol. 1, p. 281.

yellow; and three or four biliary ducts proceeded from this viscus, as large as any I had ever witnessed; indeed one of them would nearly have admitted my little finger. No cause of this dilatation appeared at the time; but, had I found the trunk in which all these branches unite proportionably wide, I should probably have conjectured that a calculus had formerly lodged there.

In some places one of the iliac arteries was tortuous like the splenic; and the inner surface of both iliacs was somewhat rugose, and of a brown colour.

The bulb of the corpus spongiosum urethræ, which is generally black from congested blood, contained none in this subject—a circumstance which I do not recollect to have observed in any other body. Its cellules, which were open enough in other respects, were only of a pale fleshy colour.

One of the testicles was surrounded by a large quantity of a yellowish serous fluid, and the cavity of the tunica vaginalis extended three inches above the upper part of the testis. This organ, though sound in its texture, was so elongated that the fibres of the epididymis appeared to be distracted; and near the larger globe of this body, a roundish corpuscle projected from the albuginea, and appeared to consist of the substance of this coat. The fasciculus of the spermatic vessels was greatly thickened, but the greater part of this augmented bulk consisted of a yellowish fat.—*Morgagni*, xliii. 22.

We must not be surprised, although, in this observation, and in others which I shall adduce, there was a considerable quantity of serous fluid, and often only a solitary tubercle, and that not a large one. It might be the remains of a large hydatid, or one which, for a considerable time, had secreted fluid. There might also have been similar corpuscles which

had disappeared. Besides referring to the case of an aged man already detailed,* I shall subjoin two others, one of which demonstrates, that tubercles in this part are not always solitary; and the other shows how these productions may elude the eye of the dissecter.—23.

CASE 5.

Hydrocele, hydrothorax, diseased arteries.

An aged peasant died in this hospital from hydrothorax, in January 1731.

Dissection. The thorax contained a redundancy of serous fluid, and the lungs were flabby and greatly diseased. The aorta was ossified in several places, and that branch of the cœliac artery which ascends to the fundus of the stomach, was surprisingly contorted, frequently inflecting itself backwards into the form of crisped or frizzled hair—an appearance I never saw before.

The urinary bladder was contracted, its coats were thickened, and internally inflamed. In the middle of the orifice of the urethra, at the posterior surface, a portion of the prostate gland, resembling a moderate-sized grape, protuberated within the bladder.

One of the testes was small, and was surrounded by a large quantity of serous fluid, which pervaded the tunica vaginalis. From the albuginea, where it invests the testicle, near the larger globe of the epididymis, a tubercle was prominent; and another projected from the membrane covering the epididymis itself.—*Morgagni*, xliii. 24.

* Vide page 273.

CASE 6.

Double hydrocele ; loose body in the tunica vaginalis testes.

The subject of the present case fell from an eminence about the beginning of April 1740, and fractured the bones of the cranium and thorax. He had a hydrocele on each side of the scrotum, and I shall describe the appearances observed on examining these parts.

Dissection. Both tunicæ vaginales contained a limpid watery fluid, but not in equal quantity; for whilst the cavity of one was but little extended, the other was dilated so as to reach the upper part of the os pubis, and notwithstanding its diameter gradually contracted, it retained considerable breadth. The testicles appeared healthy, although that contained in the greater cavity was considerably larger than the opposite. A small and softish tubercle was attached to the albuginea of the smaller testicle, and appeared to be constituted of the substance of that membrane; on the other side there was nothing like this, but at the time the fluid was discharged, a substance escaped with it, the size of a small grape, and of the same form, except that it inclined to an oval figure. In the middle of one extremity there was a short and slender neck, by which it had adhered to some part, so that the body resembled a small bottle, or, to retain the preceding comparison, a grape with a stalk of the same nature as itself. The whole of this body was of a white colour, and of a dense and compact texture, except a small portion, of an irregular figure, which occupied the centre, and appeared to be a kind of nucleus. This central part exhibited a yellowish aspect, and was nearly as hard as

bone ; but the remainder was somewhat compressible.—*Morgagni*, xliii. 25.

In former sections I have described testes from which roundish corpuscles were prominent and even pendulous, which appeared to me a proof that hydatids had ruptured. On some of these occasions the tunica vaginalis contained but little fluid, and, at times, none. I shall subjoin similar instances, and then assign reasons why none of these cases present an insuperable objection to my opinion.—26.

CASE 7.

Tubercle on the tunica albuginea testis.

A man was brought into the hospital on account of an incarcerated hernia, but it was too late for any assistance to be afforded him. He died a few days after we had dissected the subject of the preceding case. The body was examined by Mediavia.

Dissection. The hernial sac, being confined beneath the cremaster muscle, and the annexed tunica erythroides, had the spermatic vessels and the testes behind it. The sac contained a duplicature of the intestinum ileum, which was slightly adherent to it. However, although this adhesion could be destroyed by the finger, the protruded part did not admit of being returned into the abdomen, in consequence of constriction in the ring, and of the distention of the bowel. The ring was of a blackish colour ; and not only did the intestine within the sac present this appearance, but also the adjacent part within the abdomen, to the extent of half an ell.

Within the cranium, the meningeal vessels were greatly distended with blood, and a redundancy of serous fluid had been deposited.

The tunica vaginalis of one of the testes contained some yellowish serous fluid, but so small in quantity

as not to exceed the third part of a spoonful. However, from the tunica albuginea, where it invests the upper part of the testicle, a small tubercle projected, which was of the same colour as the coat itself, and apparently resembled it in texture.

Morgagni, xliii. 27.

CASE 8.

Tubercles on the tunica albuginea testis.

A native of Trent, advanced in years, died under diseases of an apoplectic character : but I shall only subjoin the morbid appearances which related to the testis.

Dissection. One side of the scrotum contained fluid, but it was inconsiderable in quantity. The tunica albuginea was greatly thickened, and in some places its surface was beset with tubercles of the same colour as the membrane itself.

Morgagni, xliii. 28.

CASE 9.

Excrescence in the tunica vaginalis testis.

The body of a man reported to have died of pleurisy was brought into the college in January 1750.

Dissection. There was more fatty substance beneath the common integuments of the scrotum than could have been expected in a man who was not generally fat ; and when I divided the coats of one of the testes, I did not observe any fluid issue from the cavity of the tunica vaginalis : but near the upper extremity of this testicle a small reddish excrescence was prominent from the tunica albuginea.

Morgagni, xliii. 29.

From these and other cases of a similar description, it appears that when there existed numerous

tubercles, as well as when the tubercle was solitary, no great quantity of fluid was found in the tunica vaginalis; and also, that none had accumulated when a reddish excrescence was still prominent: though I recollect to have intimated that this excrescence afforded evidence of an hydatid having burst. But notwithstanding these circumstances, there is nothing inimical to the supposition that the hydatid lately ruptured was small, or that some, or even many corpuscles, are the residue of hydatids which existed long before. The absorbents, which in the tunica vaginalis of some persons are but few, or are obstructed, so that the effused fluid is long retained, may, in others, be more numerous, and their orifices more open; therefore, I see no adequate reason to abandon the conjecture I have already expressed.

Whatever idea may be entertained of this opinion, we may infer, from the preceding observations, that hydatids, excrescences, and corpuscles, have generally presented themselves to me at the upper part of the testes, and therefore near the larger globe of the epididymis: and when they were prominent in both testes, their situations frequently coincided. Indeed the hydatid alluded to above,* as resembling the testis in figure and magnitude, was formed upon the same part, or very contiguous to it. The cause of these occurrences may probably be found in the adjacent insertion of the fasciculus of spermatic vessels.—30.

In the following instance it appeared to me that the fluid was not situated between the tunica vaginalis and tunica albuginea, but within the albuginea, itself.

* Vide page 121.

CASE 10.

Hydrocele of the tunica albuginea.

In the month of March 1706 an old man fell from an eminence, and died from injury of the head. I shall only particularize the morbid appearances in the scrotum.

Dissection. On the same side, as well as hydrocele the man had an omental hernia, which descended into the scrotum, but the protruded substance was drawn into the abdomen with facility. There was another cyst, much smaller than the hernial sac, indeed not larger than the testicle, though of considerable width. This sacculus consisted of a smooth and inseparable membrane, containing a yellowish fluid, and nearly surrounding the testis.

Morgagni, xliii. 31.

More than once I have separated the tunica albuginea into two membranes, and Teichmeyrus affirms that it may be divided into three: therefore, I supposed that the lesser sacculus was formed of two of them, by the interposition of water. I am not aware that this kind of hydrocele has been observed by any other author.—32.

In dropsy of the scrotum the cells are distended from the same cause as the cellular texture in other parts; and Benevoli relates, that in an ascitic patient the peritoneum was protruded into the scrotum, and when perforated there, the fluid burst forth with great impetus.—33.

In ascites, hydrocele has sometimes been produced from the compression of the superincumbent fluids upon the spermatic veins, as they pass under the peritoneum; in the same way that I once observed this effect produced by a tight bandage compressing the groin. The long course of the vessels, as well

as an imperfection in the valves of the veins, may tend to produce the same effect, particularly in those persons who, in consequence of venereal indulgences, have dilated veins.*—34.

Hæmatocele, pneumatocele, cirsocele, steatocele, sarcocele, spermatocele, and other tumours of the testicle and scrotum.

When blood is effused into the scrotum, from a wound, or any other cause, the tumour arising from it is called *hæmatocele*.

The term *pneumatocele* is applied to air pervading the scrotum; but I do not remember any author by

* Dr. Baillie describes an anasarcaous accumulation of fluid in the cellular membrane of the spermatic chord, but does not apply the appellation of hydrocele to a collection of fluid in any other part than the cavity of the tunica vaginalis, where, however, he says, it sometimes presents a cellular appearance, probably in consequence of repeated partial inflammations and adhesions. Pott and other surgeons have applied the same term to denote collections of fluid in the cellular membrane of the scrotum, and in the tunica communis of the spermatic vessels, as well as in the tunica vaginalis testis. Within the spermatic chord Mr. Pott has shown that the fluid sometimes is encysted.

M. Becard has described two cases which he considered extraordinary examples of hydrocele. In the first, the tunica vaginalis was filled with a white, opaque, and concreted substance, resembling coagulated albumen, and he calls it *concrete hydrocele*. In the other case the cavity of this membrane was occupied by a peculiar fatty substance. We might concede the strict meaning of the term *hydrocele* in relation to the former disease, but its application to the latter is wholly inadmissible.

Hydatids are not very unfrequently found within the tunica vaginalis, where they may occasion watery effusion into the cavity; but I apprehend that Morgagni supposed them to be a much more frequent cause of hydrocele than has been supported by more extended inquiries. Certainly, whatever augments the secretion of fluid into the cavity, or diminishes absorption, will contribute to its production.—*Ed.*

whom the cells of this part had been found distended with gas, except when other parts of the body were emphysematous.

Cirsocele consists of a varicose distention of the spermatic veins, and may exist either in the groin, resembling a bubonocoele, or in the scrotum. Justus Schraderus, speaking of a case of hydrocele, mentions, that there were innumerable flexures of excessively turgid vessels, but he has not stated whether they were on the surface of the testis, or in the tunica vaginalis. Celsus, however, has taught us, that these appearances may present themselves in either of these parts. I observe that hydroceles, and other affections which are denominated hernia, are often combined with cirsocele.

Horstius found varicose veins upon the scrotum so entangled with each other as to resemble a chain; and hydrocele was connected with this vascular disease.

Arantius, describing a large cirsocele, observes—*tactui turgentia vasa digiti crassitudine sese offerunt, intestinorum in modum, orbibus, et anfractibus obvoluta, quæ decumbentibus, magna ex parte delitescunt, hyemalique tempore, contracto scroto, minuuntur, ac minus infestant, æstate vero maxime.*—36.

The *steatocoele*, of the same author, is an excessive deposition of adipose substance in the scrotum, and about the testis. Sometimes I have seen fat accumulated in the scrotum to a considerable extent, and occasionally I have observed it closely interwoven with the spermatic vessels. Sometimes this fatty matter has been tinged with congested blood, and then has resembled flesh.—37.

The preceding affection is often mistaken for *sarcocoele*. Although I do not doubt that morbid flesh may sometimes shoot from the coats of the testes when they are ulcerated, yet I have never met with

an appearance of this nature on dissection. However, it has occurred to Pohlius, who describes sarcocoele as a fleshy and fibrous enlargement of the testicle, more or less hard and painful, and formed by degrees. It either increases the whole substance of the testicle, and converts it into a mass like flesh, or, growing from a part of that organ, it forms a kind of fleshy excrescence: but he acknowledges that, in general, it affects the whole testicle. He adduces one example of a sarcocoele, in which the whole of the testis was converted into purulent matter. The observations of Sproegelius show that sarcocoele has been combined with hydrocele—that the testicle has been found livid, black, putrid, or its surface hard or ulcerated—and that it has been changed into cartilage, the tunica albuginea, and the epididymis, participating in this lesion.

Not only has the substance of the testis been converted into a sarcocoele, but the spermatic chord has undergone the same alteration of texture; and this disease has ascended into the abdomen like a hard glandular swelling, where it was united with a very large and similar tumour of the mesentery.*

Heister saw four examples of an excessive enlargement of the testicle, so that the opinion of those who have asserted that sarcocoele never exceeds the size of a hen's egg, was completely refuted. In all these cases the tumour was of a scirrhus hardness, and the surface uniform; consequently he could justly affirm that scirrhus of the testicles was a more frequent occurrence than excrescences.—38.

By the term *spermatocele* some writers have represented a tumour formed by the corrugation of the vas deferens descending into the scrotum; others have considered it an accumulation of semen in the

* Vide page 136.

testis, by which that organ becomes greatly enlarged. It seems reasonable to suppose, that if the transmission of semen into the vesiculæ seminales should, from any cause, be intercepted, or if its absorption from the distended vesiculæ is prevented, the testicles will become swollen, and constitute spermatocele. After this circumstance has occurred, the soft and tender structure peculiarly observable in the testes will be gradually injured, and the seminal ducts, the blood-vessels, and absorbents being ruptured, in process of time tumours of a mixed character will be formed in the testes.—39.

Tumours of the testes, from whatever cause they may originate, appear to consist of a diversity of textures in different persons. Besides the examples which have been adduced, Borrichius has described a production resembling fleshy and nervous substance; Bartholin, resembling glandular substance, with vesicles full of blood; Schraderus speaks of conversion into a ligamentous substance; and Ruysch, into cartilaginous. On one occasion, when the testis was enlarged, I found a little fat deposited within the innermost substance, which, in other respects, was not much diseased. From this case I inferred that tumours of the testes may occasionally originate from an unnatural generation of fat, and its subsequent increase.

I have witnessed some immense tumours of the testes, but had not an opportunity of dissecting them. In a man at Padua, one of these organs was of such magnitude as to exceed the bulk of two adult heads conjoined. Another man, passing through this place, was sent to me for examination. Upon first seeing this person, being unacquainted with the object of his visit, I should have supposed that he laboured under an immense ascites, had I not observed that his abdomen was tumid only on the right side.

When all his clothes were taken off, I found that he carried this enormous bulk of substance by bandages supporting it against the abdomen, and that it reached as high as the hypochondrium, towards which region it naturally extended. It gave him no pain, and he could bear its being handled extremely well. Through the medium of touch, it excited the idea of sarcoma. Its figure was spheroidal, and it was uniformly covered with the natural skin. The man informed me, that although he had received a blow upon the testicle when a child, yet the testis did not begin to enlarge till he had arrived at manhood; and that it had acquired its extraordinary magnitude in the space of a few years.—41.

It is proper to observe that Valsalva found enlargement of the testicle generally owing to disease in the investing coats. It is not difficult for me to believe this statement, especially in particular cases; for having seen these organs considerably larger than natural, I discovered that this increase did not arise from an augmentation of their substance, but from the coats being greatly thickened.

A case is related by Waltherus, in which the scrotum and penis are said to have been so tumid that the latter extended to the knees, and the former below them; and the thickness of these parts corresponded with their length. The skin of the scrotum was three times as thick as usual; and the subjacent cells, as well as those in the septum of the testes, were so distended with a glutinous secretion, as to resemble a mass of inert flesh. The weight of the tumour, almost fifty pounds, appeared to be principally owing to the morbid deposition I have mentioned. The testes, indeed, were much enlarged, as the thickened albuginea contained fluid and tephaceous concretions, so that but a very small part

was left free for the slender tubuli of the testis to occupy. Nevertheless, it was a tumour rather of the scrotum than of the testicle. The membranes have been found thickened in other diseases of these organs.—42.

Bony substances in the testicle and tunica vaginalis.

On one occasion I found a small osseous body within the hardened substance of the testicle; and in the right fasciculus of spermatic vessels Valsalva found a bony substance within peculiar membranes. When he squeezed it between his fingers strongly, he found that it consisted of two bones, each of a globular figure. One of them was the size of a millet seed, the other that of a vetch. The latter was partially rough, but the former was polished like pearl.—*Morgagni*, xliii. 36.

In an octogenarian, many of whose arteries were ossified, two loose calculi were found in the tunica vaginalis. One of them was of a considerable size, but the other was small.—*Morgagni*, lxiv. 7.

SECTION V.

DISEASES OF THE UTERUS AND ITS APPENDAGES.

CASE 1.

Immense scirrhus tumour of the uterus.

A woman, forty years of age, after a miscarriage at five months, began to observe a degree of hardness in the region of the uterus, in which part she

experienced a pricking pain, which was constant, though slight in degree; and sometimes it was accompanied with febrile symptoms. The tumour became perceptible externally, but was moveable. Sometimes it occupied the middle of the abdomen, but at other times it fell to one side. She had considerable pain in her head; she voided feces with great difficulty; vomiting sometimes was troublesome; and occasionally the pain in the tumour was so excruciating, especially when augmented by mental disquietude, as to excite ardent fever, and to be almost intolerable. These circumstances occupied a period of ten years, within which she never conceived. At length, the tumour became immoveable, and the pain and fever being exceedingly violent, she died.

Dissection. The abdomen being opened, a tumour presented itself, equal in bulk to a large human head. It was situated in the posterior parietes of the uterus, strongly compressing the intestinum rectum, and was closely connected with the surrounding parts. Externally it was flesh-coloured, but its texture was firmer than flesh, and it contained two sinuses, the parietes of which resembled putrid animal substance. One of these cavities was empty, but the other contained a serous fluid.

The tumour also occupied the seat of the ovaria, so that no traces of these bodies remained, except that at the sides of the tumour were seen vesicles turgid with serum, some of which were equal in magnitude to a pigeon's egg. Part of the serum collected from them was placed on the fire, and another portion was mixed with acids, yet neither of them coagulated.—*Valsalva*, xxxix. 12.

CASE 2.

Fleshy tubercle of the uterus ; hydatids on the kidneys.

About the end of January 1749 I examined the urinary and genital organs of a cachectic and rather dropsical woman.

Dissection. Some parts of the surface of the left kidney were uneven from numerous vesicles full of serum, or from hydatids, some of a moderate size and others very small. In a considerable degree they were imbedded within the substance of the kidney, but did not reach the pelvis. Some of them, which had burst, might have contributed to the incipient ascites. The other kidney had one within its substance, but it did not communicate with the pelvis. The lower part of the urinary bladder was inflamed, and was of a red colour from the crowded vessels.

Upon the uterus a spherical tumour had formed, the diameter of which was a digit and a half. The greater part was prominent exteriorly, the lesser was buried in the anterior parietes, but not so as to reach the cavity of that viscus. It was universally hard, and internally of a white colour, but it was variegated in its whiteness by spots that were less white. The inner surface of the cervix uteri was white and unequally tuberoso; that of the fundus was red, and elevated by two protuberances, neither of which was red except on the surface.*—*Morgagni*, xlvii. 34.

* Dr. Sewell has related an extraordinary instance of enlargement of the uterus. When removed from the body it weighed thirty-two pounds and a half.

Although the common fleshy tumour of the uterus does not in general exceed the magnitude of the fist, yet it exists from the size of a pea to an astonishing bulk, the weight being several pounds. It is curious to observe how slender the attachment to the uterus occasionally is. I possess a specimen in which two of these tubercles arose from the uterus. The larger of them ori-

CASE 3.

Tubercle of the os uteri; enlargement of the spleen; flaccidity of the cerebellum.

About the middle of December 1748 a middle-aged woman died in the hospital. She was said to

ginated from the cellular substance beneath the inner membrane, proceeded through the parietes, and protruded externally the bulk of a moderate-sized apple. The other, which is about the size of a large walnut, is pendulous within the cavity, and hangs by merely a delicate membrane of cellular substance. When the uterus is injected none of the injection passes into the tumour. Usually they are spherical or hemispherical, but sometimes irregular. When they project into the cavity their surface is smooth, but when they grow exteriorly they have a granulated appearance. The texture is less firm in the large tumours than in those which are small. Mr. Clarke thinks there is reason to believe that occasionally they have been absorbed spontaneously. When attached to the inner surface they have descended into the vagina, and been extirpated. At times, ossified parts are found in them—indeed, occasionally, they appear to be almost wholly converted into bone. Dr. Baillie considers this the source of the bony masses sometimes found in the uterus. An instance of this pathological fact recently occurred to me, but it was not so striking an example as that related by Mr. Jukes, in the Medical and Physical Journal, from which I shall quote a few particulars.

The woman died of chronic inflammation of the mucous coat of the stomach and intestines.

Dissection. The uterus was as large as the head of a fœtus at seven months. The trunks of the principal blood-vessels were much enlarged. The os uteri was thickened; and the structure of the organ was like very dense cellular substance; and, at the lower part, the parietes were about half an inch thick. There was no appearance of muscular structure. Four distinct tumours projected from the exterior surface of the uterus, one of them being about the size of a walnut, and three somewhat smaller. Their surfaces were moderately smooth, and they were enveloped in a peculiar cyst. One of them, divided by a saw, was found to consist of a firm osseous mass, more compact towards the surface than in the centre, where it presented a cellular appearance like the heads of long bones. The other tumours were not opened but seemed to be of a similar nature. In the midst of the

have laboured under melancholic delirium and slight fever.

Dissection. The cerebrum had no peculiar hardness in it, but I found the cerebellum flaccid.

Between the muscles, in the hypogastric region, coagulated and grumous blood lodged, and appeared to have been the consequence of a recent contusion; but there was no injury correspondent with it in the cavity of the abdomen. The spleen was so enlarged that, proceeding from its usual situation, it reached quite to the os ileum; but its other dimensions were not proportionate with its length. The uterus was a little inclined to the left side. The vagina was almost universally livid, and exhaled an offensive odour; and when laid open, the os uteri appeared more on the right side than the inclination of the uterus explained. This apparently arose from the circumstance that the corona of the osculum, which was harder than usual, was increased on the left side by a kind of tumour.—*Morgagni*, xlvii. 36.

CASE 4.

Scirrhus of the os uteri.

On dissecting the genital organs of an elderly female, in the beginning of April 1743, I observed the following appearances.

Dissection. On one part of the corona of the os uteri, which was very thick, there was a roundish prominence, and on cutting into it I found it white

substance of the fundus, a large osseous tumour had formed. It was the size of a man's fist, was surrounded by a dense cyst, and its surface was irregular. The woman had been married three times, but never had a child; and she enjoyed good health a short time before death.

This appearance is distinct from the deposition of bony matter in the substance of the uterus itself.—*Ed.*

internally, and apparently scirrhus. Both of the Fallopian tubes appeared to be completely impervious.—*Morgagni*, xlvi. 23.

The uterus is extremely liable to scirrhus affections—a species of disease which it is difficult to cure unless discovered early; and which is irremediable when it has degenerated into the state of ulcerated carcinoma.—*Morgagni*, xxxix. 35.

I believe that I have more than once seen the origin or rudiment of uterine scirrhi, both on the outer surface and within the cavity of this organ. On the latter I shall have a more convenient opportunity of speaking below.

On the external surface I have seen prominent tubercles, which, at one time, were red, inclining to lividness, and at another white, and of a scirrhus hardness. I suppose that these tubercles enlarge, and constitute tumours of a scirrhus character. Pustules which have been seen on this organ, and encysted tumours, which sometimes form, are quite of a different nature.

Sometimes ulcers and excrescences are found on the external part of the uterus, as well as tumours of the atheromatous, the steatomatous, and other species; but I shall pass them by, to add a few remarks relative to scirrhi. The diseases to which I have alluded appear to me as some of their primordia. Paawius adduces an instance which also must be regarded as a rudiment of this disease. It was a white excrescence, the size of a wart, and uniformly solid. Ruysch also mentions a case in which the whole uterus was beset with small round scirrhus tumours of different sizes, growing to that viscus without any peduncle. Crellius has described a hard and solid tumour, the size of a mulberry, which adhered to the fundus uteri externally. Bony tumours, or tumours partially ossified, are mentioned in the *Commercium Litterarium*.

Observations are not wanting in which a scirrhus tumour of the uterus appeared to have been produced by numerous calculi situated in its substance; or one half or the whole organ has been found scirrhus, and forty-four pounds in weight. Numerous histories, however, are extant, in which from the situation of the tumours, physicians were liable to regard them as of a scirrhus description, though, in reality, they had not the least approximation to that nature.

Occasionally, scirrhus tubercles are conjoined with the uterus, as well as other viscera, by a peduncle—a circumstance witnessed by Ruysch. To explain this occurrence it will be sufficient to refer to the observations already made in reference to hydatids, and their transformation into these hard tubercles, after discharging their fluid; for it has been clearly demonstrated that hydatids are sometimes attached to the uterus.—*Morgagni*, xxxix. 36.

After the uterus had been injured by a midwife, Langius found a scirrhus tubercle closing the orifice so completely, that the smallest probe could not pass, nor could air be impelled through it. And a tumour described as a glandular body, the size of a nutmeg, was found within the uterus of a dropsical maiden by the younger Du Verney.—xlvii. 27.

Excrescences of the uterus.

CASE 5.

Excrescences of the uterus; globules in the ligaments having a bony nucleus; the ovaria shrunk; and the Fallopian tubes imperforate.

A woman nearly forty years of age had been carried off by an acute disease, which succeeded the chronic form. The following were the appearances presented by the organs of generation.

Dissection. The hymen was uninjured. Its reddish horns terminated in a kind of ring of the same colour; and the tumid extremity of the urethra was surrounded by the same appearance. The other orifice of the urethra, which opens towards the bladder, and the inner surface of the urethra adjacent to it, exhibited parallel, thick, and protuberant lines drawn longitudinally, which consisted of distended vessels.

The fundus uteri somewhat protuberated, which arose from three excrescences formed within its cavity. The larger of them was somewhat less in circumference than the nail of a man's thumb. It was not very thick, and was only adherent to the upper side of the left part of the cavity, by a peduncle, which was not very slender. It was so full of blood as to be quite black; and was not quite so firm in texture as the parietes of the uterus. When one of them, which was very small, was pricked, a little dark coloured fluid escaped from it, as if it contained an hydatid within its outer shell, which was nearly the colour of blood.

In each of the alæ vespertilionum, between the ovary and the tube, I observed three or four globules of various sizes. They were hard in texture, and of a brownish red colour, so that at first I supposed them to be scirrhus conglobate glands; but after dividing the membranous coat I found a nucleus of a bony hardness. They were of a white colour, their surface was smooth, they were easily removable, and resembled a moderate-sized pea. The lesser globules contained a similar nucleus, except one of the smallest, the centre of which was occupied by a softish white matter. It was natural to infer, from this circumstance, that the hard nuclei were formed by the concretion of this soft substance.

It is evident there must have been an impediment to the motion of the tubes, and their nearer approach to the ovaria by the interposition and weight of these bodies. The ovaria were dry, contracted, and shrunk ; and the tubes were impervious.

Morgagni, xlv. 24.

In many preceding articles the occlusion of the Fallopian tubes is mentioned ; but the number of these instances was exceeded by others in which, at the first trial, I thought the tubes were closed, but on more attentive examination I found that they were pervious.—25.

CASE 6.

Excrescence of the uterus ; ossification in the ovaria.

Towards the close of April 1706 a middle-aged woman died in the hospital of St. Mary de Morte, from disease in the thorax. The following deviations from natural structure I found in the organs of generation.

Dissection. The lower part of the vagina, contiguous to the orifice of the urethra, retained some traces of an ulcer, and they were more manifest in one of the labia pudendi. These appearances, with the existence of an excrescence at the anus, excited a suspicion that the woman had been affected with syphilis.

The ovaria were of a whitish colour, shrunk, and corrugated, and somewhat hard. One of them contained an empty cell surrounded by two coats, the inner of which was black, and the outer of a cineritious colour. In the other ovary, besides smaller vesicles, full of moisture, there were two pretty large cells empty. The parietes of one of them were partially bony ; but the coat of the other was perfectly ossified, and was so furrowed as to resemble folds of the small intestines.

Adherent to one of the tubes was a corpuscle, which, in form and consistence, resembled the boiled crystalline lens of a small fish; and a congeries of similar bodies, though much smaller, was united to the other. The uterus was large, its parietes were thick, and on one side of the cavity, which was more capacious than usual, a thin membrane united the anterior and posterior surfaces. From the opposite side, an excrescence originated, which, being attached to one spot only, and loose in the remainder of its substance, extended in the form of a circle, and its diameter somewhat exceeded that of a man's thumb. Its thickness was inconsiderable, its substance was almost the same as that of the uterus, and its surface was diversified with red spots. On the side opposite to that from which this excrescence grew, at the commencement of the cervix uteri, another very small excrescence originated. It was of the same texture as that just described; its figure was pyriform, except that its anterior and posterior surfaces were flattened; it hung by its stalk, and the whole of its surface was of a saturated red colour.—*Morgagni*, xlvii. 28.

The form of the latter excrescence reminded me of those uterine polypi which Ruysch has delineated growing from the lower part of the cervix, and pendulous from it. These excrescences, like polypi of the nose, may become cancerous and malignant; or they may have malignant ulcers conjoined with them.

The excrescence in the next case was of the same description as that to which I have just referred; but in the cases which succeed it, the morbid production resembled the larger excrescence in the preceding case.—29.

CASE 7.

Polypous excrescence in the uterus ; a preternatural vein.

In the beginning of 1728, when dissecting the body of a woman, I met with the following unnatural appearances.

Dissection. A peculiar venous trunk, not very small, ran parallel to the vena cava on the left side. At one extremity it communicated with the vena cava where it receives the iliac veins, and by the other it inosculated with the emulgent vein. The trunk of the aorta exhibited incipient marks of ossification.

The ovaria were small, and one of them was very much shrunk, and the other contained a few cells but no vesicles. Within a thick coat, of a pale yellow colour, the larger cell appeared to include a long sinus, which sent out small transverse ramifications ; but this appearance probably arose from a spherical cavity having collapsed and contracted.

Looking at the broad ligaments with a view to demonstrate the nervous plexuses usually visible in them, in one I found the slightest rudiment of the plexus, but in the other not even a trace was distinguishable. At the os uteri there was a greenish prominence, and, a little higher, a small excrescence was suspended, by a short whitish peduncle, from the parietes of the lower part of the cervix. It had a smooth surface, and was of a brownish red colour. With the exception of being less oblong in its figure, it nearly resembled the smaller excrescence in the preceding case.—*Morgagni*, xlvii. 30.

CASE 8.

A woman fifty years of age was wounded upon

the head, and died in the beginning of February 1738, thirteen days after the accident. I was scarcely able to examine any other parts than the organs of generation.

Dissection. The ovaria were not only considerably harder than usual, but they were also dry and without vesicles. The nervous plexus was much smaller in the right ala vespertilionis than in the left. When the uterus was opened, the posterior surface of its fundus exhibited a small excrescence, nearly of a circular figure, depressed, and only disjoined from the inner membrane of the uterus at its upper part. It seemed to be a production from this membrane, rather than from the substance of the uterus; for on cutting through all these parts, I found that the fleshy production was constituted of the same substance as the membrane. It was also of the same smoothness and colour exteriorly, except at the upper unconnected edge, where it was red.

Morgagni, xlvii. 31.

Whilst reflecting upon these appearances a suspicion arose that this excrescence, and others of a similar nature, were probably nothing more than a protuberance of the inner membrane of the uterus, from a nine months adhesion of the placenta; and that it would be particularly liable to occur in those persons from whose womb the placenta had been forcibly removed. This, it may be conceived, would account for their having a circular form. But I recollected to have found excrescences, having the same figure, in virgin uteri, or, at least, in the uteri of those who had never borne children, as in the subjoined history.—32.

CASE 9.

Excrescence in the uterus; inflammation of the pia mater.

An aged woman, who was received into the hospital on account of an ulcerated leg, was attacked with fever, owing to the impurity of the atmosphere—a circumstance which frequently occurs. At first, from the rigor, it appeared to have an intermittent type; but it became continued and acute; it was accompanied with some incoherence of speech, and proved fatal.

Dissection. The vessels of the pia mater distributed over the cerebrum, were distended with blood, and the aorta exhibited the rudiments of ossification through nearly its whole tract.

The hymen had never been lacerated, though it was low down; consequently the uterus had never been impregnated. However, the internal and posterior surface of the fundus, which was transversely dilated, was covered at its upper part with a circular excrescence. It commenced on the right side, and in diameter was not much less than that in the before-mentioned native of Bologna;* but it was not so unconnected. Its thickness was inconsiderable, its surface smooth, and its colour that of blood. The texture internally consisted of a whitish, compact, and firm substance.†—*Morgagni*, xlvii. 33.

* Vide page 393.

† Uterine polypi vary in size from the utmost degree of minuteness to a bulk exceeding that of a child's head, and not unfrequently they descend through the os uteri into the vagina, and may protrude externally. Although the examples which Morgagni has produced are but insignificant, they show that these excrescences are sometimes united to the uterus by a slender peduncle, and at others by an extended one, and that they vary in their structure. The most common, Dr. Baillie

Hydatids in the uterus.

Dropsy of the cavity of the abdomen sometimes arises from hydatids, and it is not improbable that dropsy of the uterus should occasionally be produced in the same way. Indeed Aetius mentions not only collections of fluid in the uterus, but also pellicular vesicles filled with water. Examples are not wanting of the removal of protracted dropsy by the discharge of a great number of hydatids from the uterus. An instance of this nature, which occurred in an old woman seventy years of age, is related by Kannegiesserus.

The vesicles within the uterus sometimes present the appearance of bunches of grapes, and may be denominated *mola vesicularis*. The small vesicular excrescences which I have seen in this organ, and which will be described hereafter, had no trace of branches to which the vesicles were hung; but were crowded, and adhered together either by their own parietes, or by means of an interposed substance which was neither slender nor ramifying.

Morgagni, *xlvi. 13.*

Within my own knowledge a matron of Forli, about forty years ago, discharged vesicles of various sizes; and here, in 1727, the wife of one of the governor's servants, supposed to be pregnant,

says, consist of a hard substance, divided by thick membranous septa, and showing precisely the same structure as the fleshy tubercle. He mentions another sort of polypus which consists of an irregular bloody substance with a number of tattered processes hanging from it; the internal structure exhibiting laminæ, with small interstitial cavities: or, of loose texture, having large irregular cavities. Mr. Clarke mentions an instance in which it resembled cerebellum. They are usually productive of mucous and occasional bloody discharges, and, not unfrequently, even when they are very small, they subject the patient to symptoms of excessive uterine irritation.—*Ed.*

instead of a foetus expelled a great quantity of hydatids. About the middle of 1724 Albertini saw a congeries of vesicles which a female had discharged. They resembled the larger bunches of red currants in their arrangement and figure, but were of a paler colour. They were expelled monthly ; and their expulsion was accompanied with pain and fever. Vesiculæ have been observed by Haller and other anatomists.—14.

In a case of dropsical uterus related by Bremius, the woman, for two years, was supposed to labour under encysted dropsy. She then discharged seven cysts, and one of them contained the skeleton of a foetus.—lxv. 19.

Molæ are more uncommon in brutes than in the human female, and therefore I shall mention a kind of mola vesicularis which I found in a little bitch in the year 1723. She had whelped several times, but had never produced more than two at each birth. Having copulated a month before, she was supposed to have been impregnated. At last she became dull, was seized with convulsions, and died. The lateral ventricles of the brain contained a great quantity of water, which the redness of the choroid plexuses showed to have been effused not long before death. Hydatids were found near one of the ovaria ; the cornua of the uterus were tortuous, and in several places protuberant, though not so much dilated into distinct cells, at any part, as I have usually observed in bitches that had been in the gravid state for some time. The whole of the inner surface was red, and a thick inodorous humour appeared in those places where the larger protuberances were situated. There were no primordia of a foetus, but the humour was surrounded by a soft and reddish substance, in which vesicles full of water

discovered themselves. They were of a small size, and not very numerous.*—*Morgagni*, *xlvi.* 15.

Calculi in the uterus.

I have never found calculi in this organ, but they have been met with by other persons, within my own memory.—*xlvi.* 15.

In one instance, however, I saw them apparently in the process of formation. The instance alluded to was in a maiden forty-five years of age. When the uterus was laid open longitudinally, the blood-vessels were observed running parallel on the inner surface, and, in some places, corpuscles appeared to be prominent on them. On examining two larger bodies, which were situated in the common boundary of the urethra and bladder, I found they were peculiar substances, of a brown colour, roundish figure, and hard. I believed them to be calculi *sui generis*; and supposed that the others, which were smaller, less hard, and not round, consisted of similar matter, but were not yet perfectly formed.

Morgagni, *xxxiv.* 33.

Obliteration of the os uteri.

The mouth of the uterus is sometimes closed by constriction or agglutination. Examples of this de-

* A watery fluid, to the extent of even a hundred pints, has been reported to occupy the cavity of the uterus: and if such cases really occur, it must be effused by the small arteries of the uterus. *Morgagni*, however, has been fully sanctioned in the opinion, that these collections have frequently had an hydatid origin; the fluid being contained either within a solitary and large cyst, or in a considerable number of cysts. They excite most of the symptoms usually attendant upon utero-gestation, and, not unfrequently, are expelled about the completion of the term of nine months.—*Ed.*

scription may be quoted from Haller, Fabricius ab Aquapendente, and Benevoli; in whose case we may suspect that, besides the constriction, there probably was a preternatural membrane by which this aperture was rendered impervious. Littre, on dissecting the body of a sterile woman, found the investing membrane of the vagina extending across the os uteri, and consequently obstructing it. Hippocrates maintained that a membrane might extend over this orifice after birth. What I have seen concerning this production will be demonstrated by the following observation.—*Morgagni*, xlv. 16.

CASE 10.

The os uteri obstructed by an adventitious membrane.

A woman, fifty years of age, whose right leg was four digits shorter than the left, died in this hospital from asthma, in January 1747. I attentively examined the urinary and genital organs.

Dissection. The lower part of the bladder was affected with phlogosis, and the orifices of the ureters were somewhat expanded.

The state of the hymen and other parts indicated virginity. There was the same phlogosis of the hymen, and of the contiguous external surface of the pudendum as in the bladder; and from this surface there arose some very small tubercles of a red colour. The Fallopian tubes and the broad ligaments exhibited a turgid state of vessels. The ovaria were scirrhus, and their surfaces tessellated.

The inner membrane of the fundus uteri was of a bright red colour, and upon the anterior and posterior surfaces of the fundus there were excrescences, which, though very slightly elevated, had an extensive circumference. I attempted to pass

a probe from the fundus to the orifice, but found that the passage to that aperture was not open. When I examined this orifice from the vagina it appeared natural, but a little below the orifice there was an appearance of corrugation. The aperture itself was very small and circular; and when examined internally a whitish membrane presented itself, at a little distance from the outer orifice. This membrane was so complete as to obstruct the passage of a probe in both directions; but, unless we suppose it to have been of short duration, or that the absorbents had removed the fluid, I think there must have been some minute perforation through it, or some interval in its circumference, as no fluid was accumulated in the uterus.—*Morgagni*, xlvi. 17.

On examining the body of an old woman I found that the parietes of the cervix uteri adhered to each other, and the fundus contained a small tumour. The fimbriated extremities of the tubes adhered to the ovaria. These unnatural adhesions had probably resulted from difficult parturition.

Morgagni, lxxvii. 11.

The os uteri will not only admit of being felt with the finger, but it may be brought into view by means of a speculum, or even without it, especially if the vagina is short, by introducing an ivory or crystal funnel, of a proper length and breadth, and, if necessary, employing a light. In this way I have seen the os uteri more than once.—xlvi. 18.

The os uteri has been found without any corona, or the least protuberance within the vagina.

The Fallopian tube impervious, and adherent to the ovarium.

In many of the previous dissections I have reported an occlusion of the Fallopian tubes, and I have acknowledged that, more frequently, when at the

first trial, I thought them obstructed, on more attentive examination they proved to be pervious.

In young and old women I have sometimes found the tubes obstructed in consequence of their adhesion to the ovary. This circumstance was observed by that excellent anatomist Ruysch, and has been noticed by others. The following are additional examples.—*Morgagni*, xlvi. 25.

CASE 11.

The urinary and genital organs of an aged woman, who died in consequence of a blow upon the head, were brought to me for the public lectures in the college about the end of January 1743.

Dissection. The inner surface of the aorta, where it descended between the kidneys, exhibited asperities and partial ulceration, from osseous scales, which were so thickly distributed that the orifices of the lumbar arteries were scarcely discoverable.

The tubes of the uterus were not only adherent to the ovaria, but their structures were confounded, especially on one side, where there were no fimbriæ. In other respects the ovaria were not tumid.

Morgagni, xlvi. 26.

CASE 12.

Fallopian tube and the ovary coherent, and the seat of an abscess.

About the same time of the year 1746, the genital organs of a woman, who died of slow fever about the thirtieth day after parturition were brought to me.

Dissection. The right ovarium and tube were agglutinated to each other and to the neighbouring colon; and were partially destroyed by an abscess

which I supposed had been the principal cause of the fever and of the fatal termination. The state of the uterus was such as might have been expected in a woman who had so recently been parturient. Part of the corona of the os uteri was of a violent colour, inclining to black; and on cutting into it, I observed, within the substance of its parietes, a blackness which appeared to arise from accumulation of blood in the dilated vessels. It extended from the orifice through half the length of the cervix. There was no appearance of corpora lutea, nor was there any vesicle except a little spherical cell the size of a small grape. It was empty, was constituted of thickish coats of a white colour, and was situated immediately beneath the membrane of the ovary.

Morgagni, xlv. 27.

Conception may take place should no more of an ovary than one mature vesicle remain in a healthy state.

The orifice of the tubes has been found imperious, and without fimbriæ, though the woman antecedently had given birth to offspring; but there is no reason to suppose that the obliteration of the tubes had preceded the commencement of utero-gestation. Inflammation arising from difficult parturition is a circumstance upon which these adhesions are very liable to ensue, especially if the subsequent recovery is not favourable.—28.

The middle of the Fallopian tube has been found adherent to the ovary; and, in the case alluded to, the ovary contained some white hollow globules.*

lx. 10.

* Adhesions between the tube and ovary, and obliteration of the canal of the former, may result from adhesive inflammation; and I believe that inflammatory action is not very unfrequently produced from excessive venereal excitement. Some time ago I attended an amiable young lady, who suffered extremely, and for a long time, from strongly characterized inflammation of the Fal-

Observations relative to the catamenial flux.

CASE 13.

Conception preceding menstruation.

I was acquainted with a maiden of noble family who married before menstruation took place, though the menses had been expected for some years. Nevertheless she became exceedingly fruitful. We were less surprised at this circumstance, because the same thing happened to her mother.

When young women enjoy good health, though the catamenia do not occur, it is best to wait and do nothing; lest by inappropriate remedies we should retard the work of nature, which she accomplishes later in some persons than in others.

Morgagni, xlvii. 3.

CASE 14.

Obstruction of the menses ; the uterus small.

Virgini quæ salacior videbatur, vividior certe erat, necdum menses fluxerant, cum anno exacto, duodevigesimo extincta est.

Dissection. The uterus was extremely small, yet the length of the fundus was not less than that of the cervix.—*Valsalva, xlvii. 2.*

Although the uterus certainly had enlarged, it was

loopian tubes. The more prominent symptoms were, severe pain in the inguinal regions, uterine irritation, amenorrhœa, and sympathetic tumefaction and pain in the mammæ. I had reason to suspect that the inflammatory action had been preceded by urgent venereal inclinations; which, however, might have arisen from heightened vascularity, and been an effect rather than a cause of the disease in question.

The tubes are sometimes found without an aperture or fimbriated extremity, and terminating in a cul-de-sac, from a defect in original formation.—*Ed.*

still of a very small size; and a suspicion may arise whether the delay of menstruation, in some maidens, who in other respects are healthy and full of vivacity, may not sometimes be ascribable to the very slow expansion of this organ.—*Morgagni*, 3.

CASE 15.

Amenorrhœa; tubercles in the uterus; hydrothorax and ascites.

Another maiden whose menses had been suppressed for many years, had long been afflicted with ulcers on the tibia, and she died in a state of tabes.

Dissection. There was a redundancy of serous fluid in the thorax and abdomen. The ovaria contained no vesicles, but consisted of a whitish substance resembling the pancreas, but softer.

On the inner surface of the uterus there existed a great number of protuberant glandular bodies; but only a few were situated at the upper part of the fundus.—*Valsalva*, xlvii. 4.

This is another example which may be adduced in opposition to those physicians who are over assiduous in their exertions to promote the catamenial flux. Without considering the variety and discrepancy of the causes of obstructed or suppressed menstruation, they immediately have recourse to exciting remedies, as if the uterus itself was always in a state proper to perform the secretion. By this inconsiderate procedure, instead of removing the cause of the disease they strengthen it. Whenever there exists a plethoric state of the system, or disease in the uterus itself, these excitants must necessarily have an injurious tendency. In such a case the occasional abstraction of blood, and sparing diet, will be most serviceable. Whatever remedies are employed, particular attention must be paid to the patient's

mode of living, for the catamenia are often diminished, and sometimes wholly suppressed by indiscretions in diet, or exercise, and similar causes.—5.

I shall now adduce some remarks upon the opposite condition of the uterus, namely, a profusion of menstrual discharge.

CASE 16.

Menorrhagia, from a malignant ulcer in the cervix uteri; ascites; peritoneum tuberculated; renal calculi; ureters dilated.

The woman to whom the following particulars refer, was fifty-one years of age, and it was related concerning her, that five or six years before, she began to be affected with considerable uterine hæmorrhage, so that coagula weighing half a pound, followed by some that were smaller, were sometimes expelled; and at other times, she had a discharge of a serous or watery nature. If at any time, this effusion was suppressed, she was greatly annoyed from violent pain, accompanied with a sense of weight in the hypogastric region; and these symptoms continued till the return of the flooding. Dysury was sometimes added to the preceding affections, and the urine contained fetid blood, and putrid filaments. Occasionally she was seized with sciatica on both sides, the attacks of which were particularly severe in the night, and produced hysterical convulsions. Tumefaction of the abdomen supervened, accompanied with great dryness of the fauces, eructation of flatus, and an aversion to food: and two months before the fatal termination, vomiting became frequent.

Dissection. The body was so emaciated that the muscles were almost without fleshy substance, and scarcely any vestige of blood remained. The abdomen was filled with serum having a saltish taste, and

some portions of omentum with filaments of other kinds floated in it. The whole of the inner surface of the peritoneum exhibited little bodies which resembled the indurated glandules of the pancreas. The stomach was small and contracted. The substance of the kidneys was healthy, but in the right kidney there were some very small calculi of different forms. Both the ureters contained urine, the left, indeed, only a little, but the right was dilated to the size of my finger, and full of this secretion.

In the cervix uteri there was a foul and offensive ulcer, but the remainder of the uterus was in a healthy state.—*Valsalva*, xlvii. 8.

It is easy to account for the affections which were added to the uterine ulcer and hæmorrhage. The hysteria and vomiting arose from sympathetic influence, through the medium of the nervous system; and this cause, combined with the imperfect reparation of the blood, produced the ascites. The dysuria may be ascribed to the state of the contiguous uterus, and the pain arising from it. The retention of urine in the ureters, and particularly the dilatation of the right, are attributable to a calculus which having occupied the kidney had fallen into the ureter.

Morgagni, 9.

My own observations of this disorder have been interspersed through other articles, therefore I shall not repeat them.

Organic lesions producing mucous and serous discharges.

Leucorrhœa.

Generally the uterus is the source of fluor albus, for the circumstance of purulent serum having flowed through the tube and uterus from an abscess in

the ovary, of which an instance is recorded in the Memoirs of the Royal Academy of Sciences at Paris, is a very rare occurrence. The uterus itself may be the source of a variously coloured secretion, or of serum, or pus. The latter, however, is discharged when ulceration has taken place either in the uterus or vagina. The former usually is secreted when the inner membrane of the uterus, like that of the nostrils in coryza, may be affected with a kind of rheuma. I shall first adduce observations which relate to the two former species, and afterwards those in which the discharge was purulent.

Morgagni, xlvii. 11.

CASE 17.

White mucous discharge from inflammation of the uterus ; the ovaria diseased ; inflammation of the pia mater, and effusion of serum in fever ; calcareous globules in the lungs.

A maiden, about sixteen years of age, was brought into the hospital of St. Mary de Morte at Bologna, in March 1706, after having laboured under fever fifteen days. Scarcely had she been brought in when she vomited some lumbrici teres. Worms of the same description she had vomited at home, their ejection being preceded by lachrymation, but no itching of the nostrils. She complained of pain in the left hypochondrium and neighbouring parts. Her pulse was frequent and small, as well as feeble. At the expiration of three days the female attendants observed that she had leucorrhœa. On the fourth day she was frequently delirious; her pulse became weaker and less; the tongue was red and dry; and she complained of pain in the head. On the fifth day she manifested a considerable degree of somnolency; on the sixth

and seventh urine was discharged involuntarily ; and on the eighth she died.

Dissection. There was a considerable quantity of serous fluid between the pia mater and the basis of the medulla oblongata ; and also in the ventricles, where it was of a reddish colour. The choroid plexuses were pale, but the vessels, which crept through the whole of the pia mater, and those which ramified upon the surface of the lateral ventricles, were turgid with blood. From the surface of these ventricles, the vessels, with the membrane, were easily torn away, but not without being followed by a lamella of the cortical substance of the parietes.

In several places the lungs adhered to the costal pleura, especially the left lung ; and the right was beset with miliary globules of a calcareous nature. On the surface of the liver there was a spot of a pale cineritious colour, and this appearance descended into the substance of that organ. The bile in the gall-bladder was of a blackish colour. The flat surface of the spleen was of a livid hue, and the pancreas somewhat indurated. Within the intestines there remained some lumbrici. On the inner surface of the bladder the vessels were turgid with blood, and in some places, between these vessels, we observed drops of extravasated blood through the internal coat ; and in the urethra, beneath the inner membrane, the vessels were exceedingly distended.

The orifice of the vagina, and the hymen, were of a red colour, inclining to blackness ; and the neighbouring part of the vagina, in some places, presented considerable marks of gangrene. I observed that the expanded extremity of the left Fallopian tube was drawn downwards by an hydatid the size of a large grape, and formed in the adjacent por-

tion of the broad ligament. But that a larger hydatid than this had been pendulous from the membrane of one of the ovaries, was indicated by a roundish corpuscle, which still hung from the ovary, and, though contracted, it even then preserved a small cavity between the thickened coats. This ovary likewise contained two roundish bodies, each of which consisted of a black coat investing a kind of coagulum of blood. The other ovarium also contained two cells, surrounded by a black coat, but empty. The uterus was small, and the thickness of its parietes inconsiderable. The upper part of its fundus, in its interior surface, was universally reddened by distinct blood-vessels. When I had wiped from the os uteri and the cervix, the mucus which we find there in a natural state, and then compressed the inferior part of the fundus, the cervix, and the corona of the os uteri, I observed whitish matter, of a rather thick consistence, proceed from all these places in a regular manner, which clearly demonstrated whence the leucorrhœa had originated.

Morgagni, xlvii. 12.

In a woman who had been affected with leucorrhœa, the vagina was found red, the os uteri very large, and the inner surface of the uterus unusually vascular. The vagina and cervix were smeared over with a thick and white discharge.

Morgagni, xlvii. 14.

I imagine that this state resembles that which would be found in the Schneiderian membrane after coryza.—15.

CASE 18.

Leucorrhœa from tubercles in the uterus, and inflammation of the uterus and vagina.

A girl, fourteen years of age, having died in the

hospital at Padua, about the beginning of February 1719, after suffering abdominal pains, I requested the organs of generation for anatomical purposes.

Dissection. Some parts of the abdominal viscera were tuberculated, and the omentum was exceedingly thickened as well as adherent to the fundus uteri.

The size of the uterus was proportionate to the age of the girl, who had scarcely arrived at puberty. The cavity of this organ was filled with a humid secretion, of a white colour, but inclining to a yellowish or greenish hue; and when this fluid was wiped off, the inner surface of the uterus, in several places, exhibited some small whitish tubercles.

There was no protuberant corona to the os uteri; and this orifice, as well as the vagina and hymen, were inflamed.—*Morgagni*, xlvii. 14.

The case of another young woman will be mentioned under the subject of hysteria, in whom the inner surface of the fundus uteri was occupied by tubercles like verrucæ. This surface appears to have a tendency to affections of this nature. The discharge in question has sometimes taken place even at a much earlier age than that of the girl above mentioned.—15.

CASE 19.

Leucorrhœa from disease in the mucous glands of the cervix uteri and os uteri.

In March 1741 I examined the abdominal viscera of a woman exclusively for anatomical purposes; therefore I did not observe the disease of which she died.

Dissection. The stomach extended quite to the navel, and the intestinum duodenum was extremely dilated.

The uterus was drawn to the left side, and did not admit of being retracted into the middle, on account of the resistance offered by the ligamentum latum, which was much shorter on the left side than on the right. The colour of the inner surface of the fundus was nearly that of blood, and the corona osculi had almost the same appearance, though with a greater tendency to blackness. The corona was divided into two small prominences ; and from the os uteri and the cervix a thick and almost puriform mucus issued.—*Morgagni*, xlvii. '13.

I apprehend that to this species of the disease are to be referred the appearances observed by me in other women, in whom the os uteri and vagina were besmeared with a white and thickish secretion. In one woman it was evident that it could not have had a higher origin than the osculum uteri, because the matter observed above that part was of quite a different nature. In a maiden whose vagina was moistened by a rather white and thickish matter, the dissection of the upper parts demonstrated that the secretion must have taken place from the corona of the os uteri, or from the vagina. That vesicles are sometimes prominent upon the corona as well as on the osculum and cervix uteri, and that at other times they are concealed, may be known from what I have advanced in the *Adversaria*. Naturally these vesicles contain nothing except a limpid mucus, capable of being extended into threads ; and why may we not suppose that, in consequence of disease, a different matter may be separated, sometimes opaque, and of a rather thick consistence, and occasionally even watery. These morbid secretions are witnessed in other glands, and the parts in question have been found turgid with water, and resembling vesicles ; and most authors

before me, who had observed these appearances, considered them hydatids.—19.

CASE 20.

Serum accumulated in the uterus, and turgid vesicles; hydatids on the ovary.

Whilst demonstrating some parts of the body of an aged female who died in this hospital in December 1744, I met with the following deviations from healthy structure.

Dissection. The tricuspid and semilunar valves of the heart were indurated; and, in some places, within the aorta, there were bony laminæ.

Hydatids adhered to the ovaria. When the os uteri was exposed by laying open the vagina, the border of it appeared to be divided into two parts. From each side of that border a small excrescence was protuberant, in which, and also in the neighbouring parietes of the cervix, some cells or vesicles were concealed. They were full of the same mucus which is usually found at the orifice of the uterus, except that it was of a yellow colour. As I proceeded to cut upwards through the fundus uteri, behold, there issued from this part as much yellow serum as could scarcely be contained in a spoon. How it had been retained in the fundus, even when the uterus was taken out, it is not easy to conjecture. When a similar fact presented itself in another uterus, the fasciculi of the cervix were thickened, and placed in a confused order; and I supposed that these circumstances had obstructed the deflux of serum: but this change of structure did not present itself in the case before us. Nearly the whole upper part of the cavity of the fundus, but especially its posterior surface, was tinged of a disagreeable reddish black colour.—*Morgagni*, xlvii. 16.

In a case which will be related under the subject of prolapsus uteri, to show the injurious effects of a neglected pessary, the uterus appears to have been in nearly the same state as in the preceding instance.

Though it is a more unfrequent occurrence, yet we have seen vesicles, even in the fundus uteri, containing mucus of the same nature as that which distends the vesicles at the mouth of this organ; and a discharge of a watery fluid, of a white and thick matter, or matter of any other colour, may also proceed from the fundus uteri. It is incumbent upon me to confirm this statement by observations.

A case has already been related, in which an excrescence was covered with vesicles of this description; and when I treat on the subject of lameness, a tubercle in the upper part of the fundus uteri, consisting of a congeries of those vesicles, will be described. I shall also subjoin other examples.

Morgagni, xlvii. 20.

CASE 21.

*Pendulous vesicles in the fundus uteri.**

The urinary and genital organs of an old woman were brought to me when I was teaching anatomy in the college, in February 1740.

Dissection. I noticed that the trunk of the aorta was not exempt from the rudiments of ossification.

The fundus uteri being opened, I observed vesicles not only in the part adjacent to the cervix, but

* Although Morgagni attributed these small vesicles, hanging in clusters from a common stem, to another cause, I believe they were nothing else than hydatids, which had formed in the uterus.—*Ed.*

on one side, a little higher up, there was a small pendulous cluster of them. They were connected together by the interposition of a whitish substance, from which a stalk, neither very short nor very slender, was formed. By this peduncle the cluster was attached to the internal coat of the uterus, which was healthy, and consisted of the same whitish structure.—*Morgagni*, xlvii. 21.

These vesicles had formerly been torn from the membrane of the uterus by some accident, but otherwise they and their mucus were in a natural state.—22.

CASE 22.

Vesicles at the cervix and fundus uteri.

Near the end of March 1717 I attentively dissected the genital organs of a maiden thirty-three years of age.

Dissection. The uterus preserved its natural state. For although the vessels about it were unusually tumid, and the internal substance turgid with blood, yet these appearances were owing to the catamenial flux being at hand when the woman died. When the fundus uteri was compressed, drops of blood formed upon the inner surface of that part, but no blood escaped when the same pressure was made at the cervix. There were two excrescences within this organ, one at the right side of the fundus, the other at the corresponding side of the cervix. Both of them were small, and consisted of similar vesicles; but on cutting into them, the natural mucus flowed from the lower cluster, and a limpid water from the upper.—*Morgagni*, xlvii. 23.

CASE 23.

A vesicular excrescence on the os uteri.

A woman, seventy-five years of age, when apparently enjoying good health, was seized with apo-

plexus, and died within three days. Only the abdominal and pelvic viscera were brought into the college, when I was teaching anatomy in February 1735.

Dissection. Some of the mesenteric glands were a little enlarged. The cavity of the appendicula vermiformis extended only through a third of that process.

From the corona of the os uteri an excrescence hung into the vagina, the size of a very small cherry, and was blackish and tuberoso externally. On cutting into it, I found that it was nothing else than a congeries of vesicles of a somewhat larger size than natural, some of which contained the natural mucus of which I have spoken, and others were filled with a watery fluid.—*Morgagni*, xlvii. 24.

Purulent discharge from ulceration.

Hitherto I have only spoken of those mucous or serous discharges which often admit of removal, or, at least, may be greatly diminished. I shall now proceed to those in which the secretion was purulent. When this results from a cancerous ulcer in the uterus, as is generally the case, the disease is irremediable from the beginning, and, indeed, scarcely admits of alleviation. Whenever the patient experienced a mitigation of suffering, I supposed that the vagina was principally affected. A few ounces of new milk containing opium, injected into the rectum at night, procured repose, which, though but of short duration, was exceedingly seasonable. To one of these patients the injection did not afford rest in the commencement of the night, but, the following morning, relief was uniformly enjoyed. When the opiate was administered to this patient by the mouth, she obtained a remission of her pains, indeed, and was

enabled to sleep a little, but these advantages were succeeded by distressing stupor.

Morgagni, xlvii. 25.

The symptoms of the fluor now under notice vary somewhat according to the part which may be ulcerated, but I shall not amplify on this subject, because ulceration of the uterus has been already adverted to. Cases of this description are related in the *Sepulchretum*, and to them others might be added. On reading these instances it appears, that after uterine hæmorrhages and purulent discharges, suppurated tumours or ulcers were uniformly discovered in the uterus.

In the wife of Maximilianus Preussius, among the cysts which filled the uterus others are described, which resembled abscesses filled with a purulent fluid, of a greenish white colour, and extremely fetid. One of them had perforated the bladder in several places, and pus had often flowed with the urine.

In the cavity of the uterus, after wiping off the pus, Hoffman found a great number of small caverns and loculi; and Klaunigius discovered a cancerous ulcer in the cervix, so extensive that nothing remained of the natural substance of this part of the uterus except the external membrane.*—26.

* Mr. Charles Mansfield Clarke, in his valuable *Practical Treatises on those Diseases of Females which are attended by Discharges*, distinguishes five species of discharge; namely—transparent mucous discharge—white mucous discharge—watery discharge—purulent discharge—and sanguineous discharge. The diseases characterized by the four first-named species are as follows:

1. *The transparent mucous discharge* from the vagina he attributes to two causes perfectly distinct and dissimilar. One arising from increased action of the vessels, and the other dependant upon debility. The individuals most liable to the former species are plethoric and strong women, whose habits are sedentary, who indulge much in the pleasures of the table,

Hysteria.

In the present state of anatomical knowledge, it will not be supposed that I should adopt the erroneous notion, which has been entertained, of the uterus ascending to the septum transversum, and even to the fauces. And though we retain the words of Hippocrates, *uterorum intro cedentium*, we do not understand them to imply the actual ascent of the uterus, but irritation propagated from the uterus, the tubes, or ovaria, and ascending, through the medium of nerves and membranes, to the upper parts of the body. Although by the term *hysteria* we believe that this affection only can with propriety be intended, yet I shall not dispute with those who comprise under this appellation various and multiform diseases to which females are liable, and which often originate from causes in which the uterus does not participate. Nor shall I contend with those persons

and suddenly become corpulent. The usual subjects of the latter species are those women who have undergone protracted diseases, profuse hæmorrhages, or mental anxiety. Women who keep bad hours, indulge too much in bed, suckle too long, or are exposed to any other of the numerous causes which enfeeble the constitution.

2. *The white mucous discharge*, which is opaque, perfectly white, and, in consistence, resembles a mixture of starch and water. A morbid state of the glands of the cervix uteri probably gives rise to it. It may result from inflammation of the cervix, and inflammation of the substance of the unimpregnated uterus.

3. *The watery discharge* accompanies the cauliflower excrescence of the os uteri—hydatids in the uterus—and oozing tumour of the labium ; and may consist of involuntary discharges of urine.

4. *The purulent discharge* is found to accompany inflammation of the mucous membrane of the uterus—inflammation of the mucous membrane of the vagina—ulceration of the os uteri and cervix uteri—corroding ulcer of the os uteri—ulcerated carcinoma of the rectum—and ulcerated carcinoma of the uterus.—
Ed.

who prefer designating these disorders *hypochondriacal*, although, very frequently, in patients of either sex who are said to be hypochondriacal, the parts situated in the hypochondria are no more deranged than is the uterus in some women who, nevertheless, are said to be hysterical.

If these affections have any thing in common, the chief disorder is in the nervous system; and I think it was with much propriety that Flemyng comprised affections of both species under the general appellation of *Neuropathia*.

We are, therefore, not surprised when attacks of this description arise suddenly from terror, or indignation, or from peculiar odours. We may also understand the *modus operandi* of opium, in preventing or arresting a paroxysm, when that narcotic has been opportunely administered: for though the origin of these attacks or paroxysms may seem traceable to the lower part of the abdomen, the hypochondria, or uterus, yet the propagation of noxious influence certainly was through the medium of the nerves and membranes.

I have already related an instance of the prevention of epileptic paroxysms by opium,* and will now briefly advert to the cases of two women in whom accessions of hysteria were obviated by the same remedy.—*Morgagni*, xlv. 17.

CASE I.

A gentlewoman became exposed to the trials incident to a state of penury, and her afflictions were aggravated by the absence of her husband, by whom, in earlier life, she had had many children. She was attacked with intermittent fever, which daily increased in severity, and at length, during the cold

* See vol. i. p. 99.

fit, she was seized with such urgent dyspnœa as to be unable to breathe except with the neck elevated. Even then she respired with stertor, and experienced 'so much constriction at the chest as to believe herself on the point of death. These attacks frequently recurred, and sometimes were accompanied with convulsive struggling, and with so much constriction in the throat that she was unable to speak. The nature of the case became evident, and it occasioned me excessive trouble and difficulty to arrest, first the hysterical paroxysms, and then the febrile.

At the expiration of a year intermittent fever returned, and, after some days, violent accessions of hysteria came on also, when I resolved to administer half a grain of purified opium an hour before the accession of the fit. She experienced no attack on the first day, nor on the two succeeding ones, on which she repeated the remedy. On the fourth day, notwithstanding the opiate, she underwent a paroxysm, but it was shorter in its duration than formerly. However, the whole affection was by far more easily removed than it had been the preceding year.—*Morgagni*, xlv. 18.

CASE 2.

A slender maiden, labouring under an obstinate induration of the liver, and a variety of threatening symptoms, experienced more violent pain in the head, and greater irregularity in the uterine discharges, than the matron whose case has just been related. Every evening she experienced an attack of fever, accompanied with rigour, and the coldness was attended with a sense of compression and constriction at the chest, and a difficulty of respiration began to attack the patient. Within a few days this symptom became so violent as to constrain her to sit

down; the body was contorted, and her arms tossed about; and, when able, she complained miserably.

All efforts to prevent or to shorten the paroxysm were frustrated, till I had recourse to purified opium, by means of which I daily prevented the paroxysm, and, after using the remedy for some days, I found that the attacks did not recur, though the opium was omitted.

On the twenty-fourth day afterwards, the attack returned, but the same method was not equally successful. However, I determined not to change the remedy, but to vary the form of its administration. I therefore gave the patient as many drops of Sydenham's liquid laudanum as were equivalent to the half grain of solid opium. In this way my wishes were so completely answered that I had no longer to contend with these paroxysms.

The facts disclosed in this case led me to suspect that when the opium ceased to produce its previous good effect in the former instance, the failure arose from the circumstance that the constitution had become habituated to the remedy.—*Morgagni*, xlv. 19.

Hysterical affections have been produced by irritation in the mucous coat of the intestines, and termina, after taking infusion of senna; and also from balsam of copaiva.

In the *Sepulchretum* Mayerus relates the case of a woman whose uterus was large, and, what is very extraordinary, it was universally converted into bone, so that it was necessary to break it with a hammer to examine its cavity. This woman had been subject to hysteric paroxysms, but from the time that the uterine tumour became perceptible, the hysteria ceased. We may suppose that this cessation arose from the uterus being no longer irritable.

In another hysterical woman mentioned in the same work, and who was, at length, carried off in

one of the paroxysms, Helwich discovered four hollow excrescences attached to the external surface of the uterus, by a small peduncle of the same texture as the uterus itself. A sacculus was also prominent from one of the ovaria, and on its being cut into, about half an ounce of blackish gelatinous matter issued from it.—20.

CASE 3.

Hysteria; verrucæ in the uterus, scirrhus ovaries, and diseased liver.

A young woman who combined habitual drunkenness with prostitution, and who had formerly borne children, had suppression of the menses during four months, and then began to be the subject of hysterical affections. Afterwards she became maniacal, and, at length, in February 1717, she died in this hospital, from general convulsions.

Dissection. The liver was of a colour which resembled boiled liver, but the bile which had exuded from the gall-bladder had imparted to the intestines near it, a lively saffron tint.

The ovaria were white and hard, as well as scirrhus. They exceeded their usual magnitude, and had fallen behind the uterus, apparently from their own weight. The inner surface of the fundus uteri was smeared over with a kind of bloody mucus—an appearance which seemed to indicate that the menses were about to flow, or had recently flowed. On the same surface there also were a few smallish tubercles like verrucæ.

The thorax was not opened; and the brain was dissected in my absence.—*Morgagni*, xlv. 21.

That hepatic lesion which is compared to boiled liver has been observed in dropsical and cachectic persons.—22.

In the following case the disease of the uterus and ovaria was more strongly marked than in the preceding.

CASE 4.

*Hysteria ; polypus uteri and tumour in the parietes ;
heart partially tendinous.*

The subject of this case, forty years of age, was another of those despicable objects, who, like the former, was addicted to wine as well as unchasteness. She became so exceedingly timid, that she trembled and nearly fainted from slight causes. She vomited frequently, and could retain no solid food. She never complained of any palpitation or throbbing in the heart or head, or of any other affection in these parts. Her friends said that the only disease she had mentioned was a sensation as if something were moving in different places through her abdomen, sometimes ascending to the fauces accompanied with a sense of suffocation: from this sensation, however, she speedily obtained relief.

Early one morning she reported herself to have been seized with a violent hysterical affection, and that a body appeared to be moving through the abdomen and ascending to the fauces, where it occasioned a sense of suffocation. Within an hour or two afterwards she died, without any perceptible convulsions.

I have always deferred the dissection of persons who died under these circumstances till a proper time had elapsed to determine the actual decease. At the expiration of ten hours there was no cloudiness of the eyes, nor rigidity of the body; and the thorax retained a degree of warmth. Therefore, we applied a small lock of combed wool, the flame of a thin wax candle, and a polished glass, to the

mouth and nostrils; we placed a cup, full of water, on the scrobiculus cordis; and applied the fingers and hand to the region of the heart, and to the carotid and iliac arteries. We also blew an irritating powder up the nostrils. Not content with these and similar experiments, we punctured one of the brachial veins, and blood flowed from the orifice and also serum distinct from the red particles of the blood. We inserted the point of a sharp instrument under the nails, and placed heated iron to the soles of the feet, but these measures produced no sign of animation, and the heat of the thorax began to dissipate.

Dissection. The limbs were not lean, but they did not correspond in fatness with the extreme obesity of the abdomen and thorax. On each side of the sternum the ribs were deeply depressed, but the depressions were not apparent till the mammæ and integuments were reflected. The lungs were indurated, and the right lung adhered to the costal pleura by means of a membraniform concretion. The pericardium contained a considerable quantity of a brown and turbid fluid, and both sides of the heart were occupied with black and fluid blood. The left ventricle was dilated; the carneæ columnæ were stronger and harder than they naturally are—indeed, they appeared rather tendinous than fleshy: and the tendinous fibrillæ which connect the columnæ and mitral valves, seemed to be more numerous than usual. There were some places in the parietes of the same ventricle where the fleshy substance had become white, or, at least, a pale red, and in structure resembled the altered columnæ. This degeneracy of the fleshy fibres into a tendinous nature became more evident as we approached the outer surface, and it extended on this surface to the part which corresponds with the septum ventriculorum. The fatty substance deposited upon this viscus was not

perfectly natural, for on the posterior surface of the heart, in two small longitudinal tracts, it was uneven and of a reddish brown colour. The aorta was dilated from the heart to the curvature, and near the diaphragm it appeared to be contracted. From the heart quite to the emulgent arteries there were some whitish particles, and some lines that were slightly prominent: and not only in this course, but in other parts, and, likewise, in some of the upper branches, the inner coat was so easily disjoined from the next, that large pieces of it followed the scalpel on the slightest friction.

The omentum was drawn towards the spleen. The intestines were displaced, and greatly distended with gas, especially the colon and rectum.

From the posterior part of the external surface of the fundus uteri, a globular body was suspended by a short peduncle. To nothing did it bear a greater resemblance, in whiteness, magnitude, and form, than to a small unripe cherry, and it consisted of a fibrous and callous substance. Another tumour of this kind was imbedded in the substance of the parietes uteri. Internally the fundus uteri was smeared over with a great quantity of foul bloody mucus, and when I had wiped it away, bloody drops could be pressed out of the substance of the fundus, but none from the cervix uteri. With the exception of the upper part of the cervix, the whole inner surface was of a red colour, apparently from inflammation; and, on one side, it had a brownish hue. There were some hydatids attached to the fimbriated extremity of the tubes. Both the ovaria were tumid from cells, all of which were filled with serum except one, which contained pus: and one ovarium also included cysts of a black colour. In the broad ligaments we observed the plexus of nerves distributed in a most beautiful manner.—*Morgagni*, xlv. 23.

The prominency of the sternum, and the depression of the ribs, I should think originated in malformation. In fat women it is not easy to detect this deformity, unless the fingers are strongly pressed against the chest; but if, without any apparent cause, they are affected with much more difficulty of respiration than other individuals corresponding with them in figure, this imperfect conformation may be suspected.—24.

Concerning the degeneracy of structure in the heart, we may observe, that the strength of this organ diminishes in proportion as a greater number of its constituent fibres become tendinous; and, in this instance, the power had diminished in that ventricle which has occasion for the greatest energy.—26.

That the convulsive and some of the slighter affections to which this woman had been subject, originated from the uterus and ovaries, the unnatural appearances which we saw in them, and the sensation of something ascending from the uterus, appeared to intimate. The displacement of the intestines might have occurred in consequence of their nerves having been affected from sympathy with those which are subservient to the functions of the ovaria and Fallopian tubes, and are situated in the broad ligaments, which we saw were thickened; for the bowels are frequently disturbed from irritation arising in the ovaria.

However, it must be admitted that there are cases in which, though there existed more disease in the uterus and ovaries, yet the women had not been afflicted with the disorders in question, in a violent degree. In all persons the nerves are not equally susceptible of irritation, nor is there the same coincidence of disease, in other viscera, which disables them from resisting the influence of convulsion upon

them. We have, therefore, greater reason for apprehension respecting those hysterical or hypochondriacal persons, who labour under a lesion of any important viscus at the same time. Consequently, even in querulous patients of this description, cautious and attentive investigation is necessary. Diligence of inquiry never was prejudicial to any one, but negligence is often injurious; and to this remissness is perhaps generally to be imputed all that is true in the maxim—*Quod moriatur aliquis, de quo medicus securus fuit.*—27.

Prolapsus and inversio uteri.

Valsalva has left no dissections relative to prolapsus of the uterus. This organ may undergo displacement in various degrees. Sometimes, though prolapsed, it remains within the pelvis; but at other times it is extruded. This organ is also liable to inversion, which may occur from the extreme violence of labour pains, or from the temerity of an imprudent midwife in extracting the placenta with improper force.

Besides this descent or prolapsus of the uterus, there is also a prolapsus of the vagina, which occasionally takes place to such a degree that it may be mistaken for prolapsus uteri. This fact has been described and delineated by I. G. Widmannus, who found the protruded part to consist exclusively of the internal coat of the vagina.

Morgagni, xlv. 2.

All these lesions have been noticed by the ancient physicians, except the *inversio uteri*, and this has been hinted at by Celsus: and it has been said, that the uterus, when prolapsed, has been extirpated in several cases without fatal consequences.—3.

Upon cleaning from its sordes a large body

which had been cut away from the pudendum, and which Slevogtius supposed to be an excrescence, contrary to expectation he found that, like a thick sheath, it contained the uterus in a natural state, with the remains of its tubes; yet the woman happily recovered. This operation is not attended with a fatal hemorrhage, because the vessels, having long been drawn from their healthy situation, are contracted. And the bladder probably escapes injury from the circumstance that the vagina was inverted only at its upper part; or the external coat, by which it is united to the bladder, had not been displaced, but only the inner coat. However, these are points respecting which I do not feel perfectly satisfied.

Molinelli affirms that he has many times amputated the uterus in consequence of its inversion, especially in old women, and he found the operation perfectly safe; but his uniform success excites a degree of suspicion that some mistake might have been committed.

Accuracy of examination is not only necessary when the uterus is inverted, but also when it is prolapsed with the vagina, exterior to the labia; especially as a prolapsus of the inverted vagina alone may sometimes so impose upon the observer as to occasion a belief that the uterus was protruded within it. In consequence of the coat of the vagina being thickened, in the case related by Widmannus, there was an appearance which resembled the os uteri: however, the uterus was found in its natural situation.

When the removal of a tumour of this description becomes a subject of consideration, it is highly momentous to distinguish the precise nature of the case. If a probe be introduced through the orifice which appears to be that of the uterus, and, without

meeting with any obstacle, passes far beyond the natural length of the uterine cavity, without reaching the full extent of the prolapsed body, it will throw a degree of light on an ambiguous case, provided the tumour is not in a state of ulceration.—4.

It must be admitted that the greater part of those who assert that they have removed the uterus have been deceived by excrescences of the vagina, or of the os uteri, or by prolapses of the vagina. This must be acknowledged in reference to those women who are reported to have been parturient after the excision of the uterus, unless it should be maintained that these females had double uteri from birth.—5.

Though inversion of the uterus rarely falls under the observation of physicians and surgeons, it often occurs to midwives, especially to those who are unskilled in this department; and I learn from books, that, in some countries, this calamity often occurs to the child-bearing woman. There is another cause of *inversio uteri*, though much more uncommon than those adverted to: I refer to a large excrescence formed at the fundus uteri, and inverting the uterus by its weight.

By whatever means it may be produced, anatomical researches have demonstrated that the uterus may be inverted, for within its cavity, formed by that surface which before had been external, the ligaments of the uterus, the Fallopian tubes, and the ovaria, have been contained. From this circumstance we are able to comprehend the observation related in the *Sepulchretum*, on the authority of *Henricus ab Heer*. In the case alluded to, it is said that on the uterus being extirpated by a mountebank, a considerable portion of the colon was removed with it, in consequence of its

being contained within the cavity of the inverted uterus.

Sandenius particularizes an instance in which the woman survived the inversion for many weeks, though the uterus was not replaced; and an example of the replacing of the uterus several days after the inversion, has been recorded by Genselius. However, these occurrences are rare in comparison with the numerous instances in which it is speedily fatal. Bohn mentions the case of a woman who had been delivered of her first child, and died within an hour after the uterus had been violently drawn downwards from its natural situation, which was found to be unoccupied. Boehmerus cites an instance from Chapman, which, if I understand it correctly, proved fatal even more speedily, after a similar accident.

In this country I have never heard of more than one instance of prolapsus uteri from inversion, and not once of prolapsus independently of inversion. However, the descent of the uterus, and prolapsus of the vagina, occur rather frequently; and I have not only occasionally seen it in the living body, but have examined the parts after death.—6.

CASE 1.

I was requested to examine the sexual organs of a lady about twenty-five years of age, to determine the nature of a round body, pendulous within the vagina, and resembling the penis. I immediately discovered that it was the cervix uteri, which had descended below the middle of the vagina. Though married she had never borne any children, and therefore the os uteri was narrow and circular; and from that orifice I saw a little blood proceeding, for she had recently menstruated.

I shall now communicate what we have observed

in the dead body—first in brutes, and afterwards in the human female. These facts will clearly show that it does not happen merely from gravity, but from other causes which act upon our mechanism.—7.

On dissecting a bitch that died pregnant, Valsalva found the vagina inverted, and the uterus was considerably nearer the orifice of the vagina than usual. That the uterus had changed its situation was confirmed by the approximation of the cornua to the vagina, especially of the right cornu, in which there were three foetal whelps.—8.

A cow, seven months in calf, was killed on account of being subject to a protrusion of the vagina. I found this sheath inverted to a considerable extent, at that part where it is connected with the extremity of the cervix uteri, and, in that place, it was not wholly free from ulceration. The uterus and foetus were in a natural state.—9.

In these animals the disease could not be imputed to the parts being drawn downwards by their weight; but in women I apprehend that it is frequently occasioned in that way; and of this circumstance the following case probably affords an example.—10.

CASE 2.

Prolapsus vaginae and procidentia uteri; paralysis from deposition of serum.

An aged woman at Bologna had been afflicted with hemiplegia, in consequence of which, for many years, she had been unable to move one side of the body; and, at length, the power of motion in the other side was likewise abolished. A round body also protruded from the vagina. Ultimately she was seized with inflammation of the thorax, and died at this hospital in 1704.

Dissection. The head exhibited nothing worthy of notice except an accumulation of serum between the dura and pia mater. The thorax was not examined.

I observed that the fundus uteri occupied a lower situation within the pelvis than usual, but its descent was not such as to lead me to suppose the mouth of the uterus so low as it actually was. The labia pudendi were greatly dilated, and a body three or four digits in length protruded. This substance was of a cylindrical form, very thick, and its texture resembled that of ligament, except at the bottom, where ulceration had taken place. I perceived that it was the vagina inverted. At the upper and anterior part of this prolapsed body, was the orifice of the urethra; and beneath this aperture, on each side, the considerably dilated mouth of a lacuna was visible. In the middle of the lower part there was an orifice through which the os uteri could be distinguished at no great distance; and I passed a probe through it without any difficulty to the upper parietes of the cavity of the uterus. Surprised at the unusual length of this organ I cut into the vagina, and within it lay the cervix uteri, extremely lengthened. We could not wonder at this elongation because the parietes of the cervix itself, as well as those of the fundus, instead of being firm as they naturally are, were extremely relaxed and flabby; and all the other parts belonging to the uterus, and situated within the pelvis, were in the same condition.

Morgagni, xlv. 11.

It is evident, in this case, that the uterus had been drawn downwards by the weight of the vagina.

In this volume a case has already been described, in which the increased thickness, and consequently the augmented weight of the corpus glandosum urethræ, had drawn the uterus somewhat downwards;

but because the structure of the cervix was not so much relaxed, the orifice had not descended so far as in the preceding instance. But the corpus glandosum being perforated in the middle of its lower part with the orifice of the urethra, it resembled the mouth of the uterus.*

In other women I cannot deny that the uterus, when of an unnatural weight, may invert the vagina. For the ligaments of this organ, as well as the connecting parts of the vagina, admit of extension; and being membranous, they frequently become relaxed from internal causes. In the instance described by Peyerus, the prolapsus certainly was bulky; for the uterus was extruded from the pudendum, and hung within the inverted vagina: nevertheless, the ligaments of the uterus and bladder were not ruptured, but merely relaxed. Ruysch has intimated that this state of the ligaments of the bladder must necessarily happen in such instances of prolapse.—12.

Procidentia uteri sometimes owes its origin to the ligaments being relaxed by the weight of an impending ovarium. Schlenckerus relates an instance of this description, in which the ovary had become enlarged and stony. Abraham Vater also witnessed a similar effect from the pressure of an ovarian tumour.†—lxvii. 3.

* Vide page 117.

† Morgagni has here brought under consideration *inversio vaginæ*, *procidentia* and *prolapsus uteri*, and *inversio uteri*.

Inversion of the vagina is not a very unfrequent occurrence, and is most liable to occur when the pelvis is large, the external orifice wide, and the soft parts, generally, relaxed. Laceration of the perineum, as well as co-tiveness, increases the liability to it; and indeed the same effect will result from any mechanical pressure. When the membrane protrudes to some extent, it occasionally presents a somewhat anomalous appearance, and

These cases are generally brought on by degrees, but there is another form of procidentia of the uterus, which takes place suddenly, and though much less than those already described, it deserves our notice. I allude to the descent of the uterus during labour. At this period the mouth of the uterus approaches the orifice of the vagina, and dilates it into a large circular aperture; and when, owing to the size of the fœtus, or to the narrowness of the passage, the birth is slow and difficult, it frequently happens that the efforts of the woman occasion a protrusion of the os uteri to the extent of an inch or two; but this occurrence does not portend any mischief. It is a much more astonishing circumstance, that the gravid uterus had hung within the inverted vagina, exterior to the pudendum, and yet the fœtus has been born. Cases of this description, however, occurred to Harvey, Sandenius, and Fabricius.—xliv. 13.

I have already intimated, that sometimes the internal membrane of the vagina is relaxed and extended by an afflux of humours to that part. The inversion of all the parietes is not easy of explanation, and therefore accurate examinations of the bodies of those who have laboured under this disease are still requisite.—14.

Various remedies have been employed, both in-

has not only been mistaken for the prolapsed uterus, as Morgagni has intimated, but it has also been mistaken for that species of monstrosity called hermaphrodite. Procidence and prolapse of the uterus are very much connected with a defect of tone in the vagina, though it cannot happen without a corresponding relaxation of the broad and round ligaments of the uterus itself.

Inversion of the uterus is a more rare occurrence than its descent, and generally it arises from mismanagement of the placenta, or from the weight of a polypus attached to the fundus.—*Ed.*

ternally and externally, to counteract this descent of the uterus, and one of these expedients consists of pessaries constructed of an annular figure, or in any other form which admits of a perforation; and it is as indispensable to use an instrument of this kind in these cases, as in those of prolapsus of the rectum. There are two circumstances, however, which render the treatment of prolapsus of the vagina more difficult than that of the rectum. In the first place the inevitable weight of the uterus, when that organ has previously descended, again inverts the replaced vagina; and in the second, the sphincter vaginæ muscle does not constrict the orifice so firmly as the sphincter ani. When pessaries are introduced with violence, or are badly constructed, they may produce fatal consequences. This circumstance was observed by Benevoli. At least, they are likely to be detrimental, especially if long worn without being taken away for the purpose of cleaning them.

In the *Commercium Litterarium* particulars concerning two women who suffered from these causes have been recorded. One of them had introduced a ball of thread or worsted covered with wax, and it became incrustated with tartareous matter to the thickness of three fourths of a digit, and brought on severe strangury. In the other case the pessary was formed of iron, and was covered with wax like the former; and this had occasioned an ulcer of the vagina and neighbouring intestine. To these examples I shall subjoin an instance which fell under my own notice.—15.

CASE 3.

Ulceration and excrescence in the vagina from a pessary ; ligamenta lata thickened ; hydrothorax and hydrops pericardii ; effusion into the ventricles of the brain.

A middle-aged woman, of moderate stature, whose habit of body appeared tolerably good, laboured under catarrh and fever, on account of which she was brought into the hospital. Her respiration became extremely difficult, so that she was unable to lie down at the latter part of the disease ; and the pulse became intermittent. She died on the fifth day.

Dissection. Although the lungs were turgid and adherent to the costal pleura, yet a considerable quantity of serum had collected in the left cavity, and the whiteness of its appearance might have excited a suspicion of pus having been effused, if there had been any probable source of that secretion. There were thick concretions adhering to the lung and costal pleura, and the viscus on this side was somewhat indurated. The pericardium was replete with serum like that found in the left cavity of the thorax, so that, at first, it appeared as if some large abscess had been opened instead of the pericardium. The inner surface of this bag, and the outer surface of the heart and of the large vessels, were covered with a whitish matter which more resembled a layer of fresh mortar than any thing else with which I could compare it. When this soft membraniform concretion was removed, the pericardium was found to be thickened and reddish ; and the heart somewhat enlarged.

The vessels in the substance of the cerebrum

were turgid, and the ventricles were occupied by serum of a dirty yellow colour.

The spleen was enlarged, and the liver greatly exceeded its natural bulk.

The uterus was somewhat nearer to the left side than to the right, and was turned forwards. The ovaria were very long but slender; they were of a white colour and hard texture. The ligaments connecting them to the uterus were considerably thicker than usual, and the vessels which ran through the ligamenta lata were not only extremely turgid with black blood, but in some places were varicose. The cavity of the uterus was full of transparent mucus. The vagina was longer and wider than natural, and contained a wooden ring, which was a proof that prolapsus had existed. The ring was of an elliptical form, and was peculiarly situated, for its longer axis was placed in the longitudinal direction of the vagina, and its shorter axis (which, however, was so long as considerably to distend both sides of the vagina,) accorded with the breadth of that canal. Therefore, from both these sides, in the parts where they were compressed by the ring, an excrescence arose, the size and figure of a large decorticated almond, and of a cartilaginous hardness. They were of a white colour, with the exception that the middle of one of them was livid; so that in this scirrhous a change for the worse appeared to be approaching.—*Morgagni*, xlv. 16.

Obliquity of the uterus.

Among other malepositions of the uterus, Hippocrates mentioned its being inclined to one side. In the time of Galen, and subsequent to that age, midwives were directed to investigate the situation of the uterus by introducing the finger to the os

uteri. Afterwards, this circumstance obtained but little notice till within our own memory, when attention was again directed to it by Deventer, who showed that difficult births often happen from the oblique position of the uterus. The womb may be inclined to one side from malformation, or from contraction of the ligaments. If this inequality exists in the unimpregnated uterus, it must still hang to the same side when conception takes place, at least during the early months, if nothing happen to counteract it. And as the uterus has enlarged with the lateral inclination, though it afterwards ascends above the ligaments, it is probable that it will continue inclining to the same side as at first. I have already mentioned several instances of this obliquity, and have others to subjoin, so that it evidently is not a rare occurrence.—*Morgagni*, xlviii. 31.

CASE I.

Obliquity of the uterus ; kidneys enlarged ; bladder thickened ; Fallopian tube adherent to the ovary.

A lame prostitute, of middling stature, and forty years of age, died in this hospital, from inflammation of the thorax, early in March 1717. At that time, being exclusively occupied in anatomical descriptions of the abdominal viscera, I only inspected those organs and the pelvic viscera of this body.

Dissection. There were many cicatrices from buboes.

Those parts of the small intestines which are nearest to the chest began to partake of the thoracic inflammation—a circumstance which often happens ; and the liver was not wholly exempt from marks of the same lesion. The kidneys were enlarged, and the pelvis of one of them contained a kind of purulent urine. The coats of the bladder

were thick, and their inner surface was uneven, and these changes had probably arisen from the syphilitic affection having extended to the urinary organs.

One of the Fallopian tubes adhered to the neighbouring ovary, but this adhesion had taken place in such a way that its unconnected orifice corresponded with that part of the ovary in which a large vesicle was situated. The uterus was healthy, but inclined to one side.—*Morgagni*, xlviii. 32.

Although this woman was lame, as well as another whose case will be mentioned, the tendency of the uterus to one side was not sufficient to excite a suspicion of the lameness having resulted from it; yet some authors have mentioned limping as an index to which side the uterus inclines. It is probable, however, that this only happens when enlargement and pain of the uterus are combined with the obliquity: so that the nerves which proceed to the leg, through the corresponding side of the pelvis, become extended and compressed; and from their connexion with the nerves of the upper limb, through the medium of the intercostal nerve, tremor in the arm has sometimes arisen from the same cause.

I have observed this obliquity of the uterus in some gibbous women, in whom it was occasioned by distortion of the spine. Of this fact the two following instances afford examples.—33.

CASE 2.

Obliquity of the uterus from distortion of the spine; hydatid in the ovary.

About the end of January 1748, an elderly woman, who was gibbous, was brought into the hospital when disease was so far advanced that I was unable

to ascertain who she was; and she died immediately after being admitted.

Dissection. The surface of the kidneys was not quite healthy, and the cervix of the bladder was unusually vascular. The right ovarium was somewhat turgid, precisely resembling the ovary of a young woman; but this turgescence arose from an hydatid, of considerable size, enclosed within its substance. The spine was distorted to such a degree, that the uterus inclined to the right side; and the left iliac vein was twice as long as the right.

Morgagni, xlviii. 34.

CASE 3.

Obliquity of the uterus from shortness of the ligamentum rotundum, and distortion of the spine.

Another aged woman, who also was deformed, died in the hospital from an old ulcer of the leg, two years before the subject of the preceding case. The kidneys and generative organs only were brought into the college.

Dissection. The right kidney was of a natural form and size, but the left, though of the same length as the opposite, was considerably narrower. The lumbar vertebræ were so inflected to the right side, that the uterus hung towards that side, and this was evident from the corresponding round ligament being much shorter than the left.

Morgagni, xlviii. 35.

In cases already detailed I have seen the uterus drawn aside, in consequence of one of the round ligaments being very short; and the same effect has been supposed to arise from defective length of one of the ligamenta lata. I apprehend that it sometimes happens from the shortness of both ligaments on one side, or from their laxity on the oppo-

site; and, at other times, the obliquity appears to arise from a diminution of length in either of them, if its fellow appears to be relaxed. I attribute the retroversion of the uterus, as well as its turning forwards, to a state of relaxation of both the broad ligaments.—36.

CASE 4.

In the lungs of a woman thirty-five years of age an abscess had ruptured at the time of lactation. At length, expectoration ceased for two days, and she died in the hospital in December 1740.

Dissection. The stomach was very long, and before reaching the antrum pylori it contracted to the extent of some digits, and then expanded into that antrum. The commencement of the colon was, also, so contracted as scarcely to exceed the thickness of a man's thumb. The small intestines appeared to be inflamed in some places on the left side. The liver was large, and extended into the left hypochondrium.

The uterus was greatly inclined to the right side, consequently the tube and ovary were forced into a narrow compass on that side.—*Morgagni*, xlviii. 37.

CASE 5.

An elderly woman was bit in the leg by a dog, and diarrhœa with febrile symptoms ensued. After the expiration of some days the former ceased, but she was seized with vomiting, and ejected worms. She had occasional intermission of pulse, and slight cough. She gradually sunk, and died in the hospital early in March 1741.

Dissection. Air-bubbles were observed in the vessels of the pia mater; and a serous fluid had been deposited beneath this membrane and also in the ventricles. Some of the bronchial glands were

greatly enlarged and contained calcareous matter. The lower part of the valvulæ mitrales was converted into a compact and white substance internally; especially at that part which is nearest to the aorta. None of the valves of this artery were totally exempt from the rudiments of ossification, and one of them, on the surface facing the parietes of the artery, was almost universally covered with bony granules. On the other surface, the corpuscle exhibited a fleshy excrescence somewhat larger than itself.

The stomach was inflated, and descended so low in the abdomen that the subjacent colon was below the umbilicus; and the whole of this intestine, except at its commencement, was so contracted as to resemble one of the small intestines. The duodenum was much larger than usual, and passed downwards, on the right side, over a long tract of vertebræ. The liver was large, and on the convex surface there were two parallel furrows which appeared as if made by a strong impression of the fingers. The spleen was somewhat thickened, and had whitish granules on its surface; and its structure internally was pale.

The uterus was inclined to the left side, and the whole of its inner surface was uneven, but not ulcerated. The fundus was covered over with dark-coloured blood, and the corona of the osculum was thickened.—*Morgagni*, xlviii. 38.

The number of these observations might be multiplied by adducing cases in which the uterus was urged to one side in consequence of a tumour in the opposite; but these are sufficient to corroborate my statement, that obliquity of the uterus is not an unfrequent occurrence. Ruysch supposed that violent pain in the hypogastrium, and continual excitement to make water, would necessarily ensue from the lateral inclination of the uterus; but these evils were not observed in the preceding instances.

In the excellent dissertation of Camerarius on the subject of generation, a curious instance of contortion as well as obliquity is related. The uterus was so inclined to the left side that the anterior part of the fundus appeared to be twisted towards that side. He conceived that the contortion, by contracting the orifice of the uterus, had probably impeded the birth of the fœtus.—39.

The obliquity of the os uteri, under these circumstances, may be an impediment to procreation by resisting the entrance of semen.—xlvi. 19.

Uterus of a small size.

CASE 1.

Uterus extremely small, no ovary, abscess in the mesentery.

The subject of this case was a little woman, sixty-six years of age, who had been married for many years, but had borne no children. She came into the hospital in December 1749, in a very weak state, complaining of nothing, however, except hunger, and the effects of an inclement season. Whilst remaining in the hospital to recruit, she was suddenly seized with deliquium animi, and died within an hour.

Dissection. The immediate cause of sudden death was found to be the rupture of an abscess in the mesentery, by which a large quantity of stinking matter was effused into the abdominal cavity.

The kidneys exhibited turgid vesicles, some of which were prominent on the surface, and others half imbedded in the substance. The outer coat of the bladder was extremely flaccid, and was so easily separable from the others as to follow the hand when lightly drawn over it. In some places upon

the inner surface of the urethra, very minute vesicles were distinguishable. The pudendum was very small, and only the rudiments of the nymphæ could be perceived. The glans and præputium clitoridis were not discoverable, but instead of these parts there was a round tubercle slightly prominent. Upon cutting into this body I found a quantity of matter similar to that which collects under the præputium of the clitoris and of the penis, and beneath that matter I discovered the glans and its prepuce extremely small. The greater bulk of the tubercle was constituted of the matter.

Although there remained but a slight trace of the hymen, *vaginæ tamen orificium ea erat angustia, ut virum nunquam admisisse videretur, certe crassiorem de quatuor minoribus meæ manus digitis non transmisisset.* The vagina, when laid open longitudinally, did not exceed two digits in breadth, and was not quite four in length. There were no caruncles or rugæ in the vagina, with the exception of a very short and narrow corrugation behind the orifice of the vagina. The os uteri was not surrounded by any protuberating corona; it was almost circular, and so small as not to admit the head of a little probe. The interspace from this aperture to the outer part of the fundus uteri, did not equal the largest breadth of my thumb; nor did the diameter of the upper and wider part of the uterus exceed the length I have mentioned. The other part did not equal even the width of the point of my little finger. On cutting into it, I found the thickness of the parietes, both of the fundus and cervix, considerably less than the figure by which De Graaf represents the uterus of an infant which died on the twenty-third day after birth, and where they are described as extremely thin. Therefore it is probable that in this woman the uterus had not increased from the time of her birth,

and certainly had never discharged any menstrual fluid.

The cavity of the cervix was double the length of the fundus uteri, and this fact is represented in the delineation alluded to. The inner surface of the cervix was of a white colour; and in it there were only some obscure fibres running longitudinally: the fundus was of a brownish red colour.

The Fallopian tubes were longer than might have been expected from the diminutive size of the uterus, and the orifice between the fimbriæ was open: but there were asperities on the external part of one of the fimbriæ, owing to white and roundish bodies, which were of an osseous texture, or, at least, were extremely hard.

There was no plexus in the broad ligaments, but many nerves traversed them in a longitudinal direction. The round ligaments were very slender; but the ligamenta lata were extremely large, in consequence of the narrowness of the uterus. Upon the upper edge of these appendages I looked for the ovaria but found that there were none, nor was there even a rudiment of them. Tracing the spermatic vessels I found that they were scarcely smaller in this subject than in other persons, especially where they proceeded to the broad ligaments, and the neighbouring portion of the peritoneum, whence these ligaments originate.—*Morgagni*, xlv. 20.

From these appearances it was evidently the same with this woman, virtually, as if she had been entirely without a uterus. Such instances are uncommon, but it is believed that when they do occur, the mammæ are small and contracted.

I have known some barren women who had scarcely any appearance of mammæ—indeed, none, except the nipple and areola. Other instances of the uterus being unusually small are extant.—21.

In the preceding observation it was an additional extraordinary circumstance that the ovaria were wanting.—22.

CASE 1.

Uterus wanting.

I was requested to examine the organs of generation of a country woman whose pudendum was in a natural state, but the vagina terminated at about a third of its usual length. No circumstance had happened from which there was reason to suspect that adhesion of the parietes had taken place. The vagina was smooth, shining, and equal; and every part appeared in its original state. The roof consisted of the same texture as the parietes. *Nec vero id lacunar urgenti explorantium digito, aut mariti jam per triennium peni, membranæ instar quæ in transversum ducta esset, quidquam cedebat; sed ut solidior crassiorque paries, renitebatur.* She was in the prime of life, and enjoyed perfect health. She never menstruated, nor did she feel any periodical uneasiness.

Morgagni, xlv. 11.

CASE 2.

Uterus wanting; the urethra mistaken for a vagina.

I was consulted by another woman, who informed me, that although the vagina was not imperforate, yet it had been so narrow that, even in early life, its dilatation had been recommended by an eminent physician, and the measures resorted to had somewhat dilated the aperture, but she was unable to bear any farther dilatation.—*Virum quoque, cui a triennio collocata esset, crebris conatibus idem orificium paulo magis amplificasse; subire autem nunquam potuisse.*

I examined the parts with an intention that should

the obstacle consist of a pretty thick hymen, to advise her to undergo its division; but, on seeing the foramen, I immediately perceived that it was the orifice of the urethra, out of its situation, and it was a happy circumstance for the woman that she was unable to tolerate any farther dilatation of that canal. If she had, undoubtedly an inability to retain the urine would have resulted.

How much detriment might have been sustained from the physician's advice!—advice which arose from an insufficiency of anatomical knowledge to distinguish the orifice of the urethra; or from an over-hasty examination; or a prejudged opinion, founded upon what had been incorrectly related to him concerning the narrow foramen.

Directing my attention to the place where the orifice of the vagina is usually found, not the smallest foramen or perforation appeared, but the part was closed with firm and solid integuments, and consequently it was not a case of adhesion. Like the former woman, she had never menstruated, nor had she experienced any periodical uneasiness about the pubes. As she was in perfect health, I began to suspect that there might be no uterus, so that if the obstacle could be removed by the knife, there would be some danger lest the bladder, or some of the intestines, lying in contact with the integuments in consequence of the absence of the uterus, might be pierced at the same time. *Itaque earum utrique auctor fui, ut æquo animo ferrent, conjugium male initum potius dissolvi, quam se temere secandas præberent.*

These cases are totally different from those in which there is a passage to the uterus, though small. Contractions sometimes take place in consequence of ulceration, and the cicatrix has proved a great impediment to parturition. They also differ widely from

those cases in which the menstrual blood is accumulated in the vagina and uterus from the hymen being imperforate—the evils arising from which are removed by a spontaneous rupture of the membrane, or by its division with the knife.—*Morgagni*, xlv. 12.

It is impossible to determine how often the uterus might have been wanting in women who had never menstruated. Two cases, however, particularly occur to my recollection, in which this deficiency was demonstrated by a post mortem examination. One of these individuals was dissected by our Columbus, and the other by his distinguished fellow citizen Fromondus. This circumstance convinces me that many other women, who had never menstruated, might have been found without a uterus, had their bodies been examined after death. However extraordinary this opinion may appear, yet if there were no other instance of this defect, it would be a most remarkable coincidence that these two examples should have occurred to anatomists of Cremona.

In Columbus's case there was only a portion of vagina, consequently it might be compared with the former of the two examined by me. Fromondus relates that the vagina was imperforate in his example, therefore the latter of my two cases admits of comparison with it. If an attempt to divide the malformed parts, in the woman spoken of by Columbus, had been made, some viscus at the fundus of the vagina would have been wounded. In the case described by Fromondus the septum was so interwoven with solid fibres as to approach the nature of cartilage; and, on its being divided, great hazard of wounding the rectum or bladder would have been incurred.*—13.

* An interesting case of deficiency of the uterus has been related by G. W. Stein. The subject of this imperfection was a lady, twenty-five years of age, who had been married five years, but

The following case affords an instance of the sides of the vagina having united.

Adhesion between the parietes of the vagina, and between the Fallopian tube and ovary.

A woman seventy years of age, who had been afflicted with asthma for a long time, died in the hospital, from peripneumony, about the middle of March 1752.

Dissection. The fimbriated extremity of one of the Fallopian tubes adhered to the ovary; and the orifice of the other tube, at its loose extremity, was impervious. The parietes of the uterus were thick, and its inner surface was somewhat moist. The fundus of this organ, and the lower part of the cervix, were of a brown colour, but the remainder was white. The cervix was narrower than usual, and the osculum extremely small.

had never menstruated. She presented the most perfect characteristics of the female form, being slender and delicate, the mammæ were prominent, the complexion fair, and the countenance animated. The parts were divided, when it was discovered that there was no uterus. The divided parts reunited, and no injury ensued.—*Med. and Ph. Journal*, Dec. 1819.

Schmucker met with a case in which there was no uterus, but the ovaria and Fallopian tubes were situated in a mass of loose cellular texture.

In a case quoted from Engel, the genitals were closed, and there was no uterus; but the Fallopian tubes and ovaria were attached to the bladder. The mammæ were large.

Pott has given the particulars respecting a woman from whose groins he removed the ovaria, mistaking them for diseased glands. She lost her feminine character. The mammæ, which had been full, sunk away, she acquired an increase of muscularity, and, indeed, her general appearance, became somewhat man-like.

A single ovary appears sufficient to preserve the peculiarities of the female character, and to fulfil their office as subservient to generation. M. Chaussin has related, that on examining the body of a woman he found only one ovarium, though she had borne twelve children.—*Ed.*

The whole of the vagina, except the commencement and termination, was perfectly like a solid cylinder consisting of a white and hard substance, so that it was impossible to distinguish the former parietes from the intervening substance. Although the diameter of the vagina did not appear to be lessened, its length did not exceed three digits. The tendon of the trochlearis muscle of one eye adhered to its trochlea.—*Morgagni*, lxxvii. 9.

This consolidation of the vagina I believe had arisen from ulceration, or from laceration during labour.—10.

Diseases of the ovaria.

CASE 1.

Ovaria shrunk; an hydatid attached to the ovary.

A woman, about forty years of age, who had formerly been affected with apoplexy, experienced a recurrence of the attack, and it proved fatal. This circumstance happened when I was teaching anatomy in 1725; but no parts were brought into the college except the urinary and genital organs.

Dissection. The trunk of the aorta between the kidneys exhibited some very slight rudiments of osseous laminæ. The kidneys, though not very fat externally, were loaded with fatty substance between the papillæ. Both the ovaria were shrivelled, but the right was by far the most meager. An hydatid, the size and figure of a chestnut, was attached to this ovarium; and, within thickened coats, it contained a brownish watery fluid. Buried in the left ovary we found a round cellule, made up of white and thickened parietes, which were uneven internally, and contained a small quantity of humour. There were none of the natural vesicles in either ovary.

Morgagni, xli. 29.

As these vesiculæ are indispensable to generation, whether they are regarded as ova, or, rather, undergo conversion into corpora lutæa, as is generally believed, it is precisely the same thing in reference to conception, whether they are totally wanting, or are deficient of that fluid which it is necessary they should contain. Therefore we are not to be surprised that a young woman enjoying good health, and married to a young man of a robust constitution, was barren; for, on examination after death, Valisneri found all the vesicles full of a turbid and fuliginous matter which had but little fluidity.

Alexander Bonis mentioned to me some particulars concerning another young woman who died within an hour after her first delivery, but who would probably have ceased to bear children had she lived. The ovaria, indeed, exhibited numerous vesicles of various sizes, filled with a pellucid humour; but every vesicle also contained a small white corpuscle. I am more especially induced to notice this observation, to point out that the appearance is the effect of disease, and must not be considered a proof that the vesicle had become fœcundated, as some authors of eminence have regarded it.—30.

CASE 2.

Ovarium converted into a congeries of cysts and abscesses; adhesion within the uterus; hydatids on the tubes.

A woman, apparently about forty years of age, afflicted with a violent thoracic disease, was brought into the hospital of St. Mary de Morte, about the end of April 1706, and died before she had detailed

the symptoms which attended the course of the disease.

Dissection. Although of a good habit of body I observed that there was no appearance of mammae except the nipple and areola, and that there were no rugæ upon the abdomen; so that she had never borne children. I perceived also that the hypogastrium, and adjacent part of the umbilical region were somewhat elevated. On opening the abdomen I found that this appearance was occasioned by a tumour the size of a very large fist; and the intestines lying upon it were urged upwards and outwards. It was situated in the middle of the pelvis, and was of a roundish figure; and though it had a tuberoso surface, yet some parts were smooth. At first it appeared to be an enlarged uterus, but, in reality, it consisted of the left ovary, which had acquired this bulk. The dense coat of this organ was rendered uneven by small abscesses, some of which, having spontaneously opened, discharged white pus, and others were filled with the same matter. From the body of the ovary, bloody ichor mixed with pus, could be expressed. When the mass was quite laid open and agitated for some time in water, I clearly distinguished some fibres and vessels, and one or two cells the size of a small grape: Within a black investing membrane, these cells contained something like coagulated blood. The remaining, and by much the greater portion of this body—indeed, nearly the whole of the solid part was a congeries of reddish vesicles, crowded together very closely, incredible in number, extremely small, and all of them distended with a filthy serous fluid. The odour which the tumour exhaled was not very fetid. Both the tubes were in a natural state, except in having hydatids attached to their outer surface.

That part of the uterus contiguous to the tumour,

had not become diseased except in its external membrane ; but within its cavity I observed that the anterior parietes were conjoined to the posterior by the intervention of small membranes.

The other ovary was rather small, uneven on its surface, and had only one vesicle contiguous to it, which, however, was of a considerable size, and included a small quantity of serous fluid within its thickened coats. The remainder of it was white and hard, and from a circumscribed spot a little white pus exuded.—*Morgagni*, xxxix. 37.

The ovary, when greatly enlarged, has been found to consist of round capsules filled with a viscid and purulent fluid.—lxv. 16.

Disease occurs so much more frequently in the human ovaria than in those of brutes, that it is natural to suppose that most of these lesions do not occur without the passions of the mind exerting some influence in their production ; for the influence which these passions have in retarding or disturbing the course of the humours is by no means unknown. To this cause we may add the monthly determination of blood to the uterus and circumjacent parts ; and this we know frequently deviates from the intention of nature in various ways. In conjunction with these causes, we must also recollect the bulk and weight of the pregnant uterus, by which, when the woman stands or sits down, the ovaria are pressed closely against the bones of the pelvis. This effect, however, is produced, more particularly, when the uterus contracts very strongly in a difficult labour ; or when it contracts irregularly, in an easy and natural labour, from the improper interference of an unskilful midwife.—xxxix. 38.

Hydatids have frequently been found attached to these bodies.—40.

Dropsy of the ovaria.

The ovaria are often so enlarged that the prominence of the abdomen resembles its appearance in ascites, of which circumstance the following case, communicated by Manfredi, affords an example.

CASE 1.

A woman supposed to be afflicted with ascites, died.

Dissection. The abdomen was not occupied by an effused fluid, but with a tumour of the left ovary. This mass weighed twenty-four pounds, being filled, in a great measure, with a viscid and black humour, which would very properly admit of comparison with the dirty water flowing in the channels of a city. The other contents of the tumour were enclosed in vesicles of unequal magnitudes, and which did not communicate. Some of them were filled with yellow matter, some with viscid matter, and others with lymph, which did not coagulate on being exposed to heat. Although only connected with the left side of the uterus, yet it was quite immovable, to which side soever the body turned, for it gave off an appendage, consisting of numerous hydatids, which descended between the uterus and intestine, and completely filled the lower part of the pelvis.*

Morgagni, xxxix. 39.

In conjecturing the nature of other obscure diseases as well as this, we must combine many symp-

* Although it is not mentioned that any prolapsus of the vagina existed in this case, the process of diseased ovary, descending between the rectum and posterior part of the uterus, seems to elucidate one of the causes of *inversio vaginæ*.—*Ed.*

toms, because some one of them may be absent, as in the preceding case, for the moveableness of the tumour has usually been placed among the diagnostic symptoms of ovarian dropsy. Perhaps, indeed, at the earlier period of the disease, not only this moveableness might have existed, but that semicircular figure, which was supposed by Brechtfeld to distinguish dropsy of the ovary from that of the Fallopian tube, might also have been observed. I have no doubt, however, that when the disease is in an advanced state, the tumour arising from a dropsy in the tube approaches the oval or spherical form as much as an aneurism of the aorta.

The more frequent examples of tumours in the human ovary have occurred on the left side.—40.

The following instance of prodigious expansion of the ovary is quoted from Willis.

CASE 2.

The abdomen of a widow began to swell, but her appetite and strength were unimpaired, her habit of body was not cachectic, and the urine was naturally excreted. At the expiration of five years the abdomen was exceedingly bulky, but, in consequence of its being prominent on the right side, it had an uneven appearance. She was not conscious of any sense of fluctuation on turning from side to side. A few years afterwards, although the abdomen was so extended as to reach a span below the knees, yet the feet were not tumid, nor was the face much discoloured. She had no thirst, except slightly in the morning; the pulse was not febrile, nor was there any inquietude during sleep. However, at the end of twelve years the feet swelled, ulcerated, and became gangrenous, from which circumstance, in conjunction with the unmitigated nature of the principal disease, she died.

Dissection. No fluid was found in the thorax or in the abdominal cavity, but an enormous quantity was contained within a membranous sac originating from the right ovarium. It had only a single cavity, and its parietes consisted of two coats, the outer being thick, white, and constituted of tenacious fibres. The spermatic vessels, on this side, were enlarged to twelve times their usual size.—*Morgagni*, lxx. 16.

Many of these cases are on record, and in some of them, as well as in the preceding, the quantity of fluid accumulated was excessively large. Riedlinus mentions an instance of this description, in which the abdomen began to swell on the left side, at which period the patient conceived, notwithstanding this affection, and was happily delivered. She continued active and robust, even in the latter part of the disease, and, with the exception of being incommoded by the great tumefaction of the abdomen, she experienced nothing which gave her uneasiness.

In a case related by Vacher, six or seven years before the patient's death, the symptoms commenced with pain in the epigastrium on the left side. Schacherus describes a case in which, at the commencement, there was an indescribable pain in the abdomen, and afterwards tumefaction gradually took place, and the weight of this tumour was accustomed to fall on that side to which the posture of the body inclined it. The two patients last referred to suffered greatly within the latter period of the disease, at which time they were unable to rest, except by supporting themselves upon their knees, inclining their bodies forward, and placing their heads upon the bed underneath them. In the case described by Schacherus the cyst had ruptured in some places, so that ascites was combined with hydrops ovarii—a circumstance which has happened in other instances.

Gullman relates the case of a maiden in whom this disease had existed fifteen years, and had extended greatly, yet she enjoyed perfect health, and her menses were regular. In the two last years of her life, however, she was frequently seized with lipothymia: and two women whose bodies were dissected by Mauchartus had been similarly affected.

Targioni saw an extremely large dropsy of the ovarium in a matron who had been afflicted with the disease thirty-four years. Whilst it was compatible with the time of life, she had an excessive discharge of catamenia. Ultimately she had frequent vomitings, and experienced some difficulty of breathing from ascending stairs; but she was capable of moving about, and of decumbence on either side or upon the back without any inconvenience, though, after death, the sac was found to occupy the whole abdomen, and to contain a quantity of water estimated at about a hundred and fifty pints. Fluctuation had never been perceptible.—*Morgagni*, xxxviii. 64.

Ludovicus Saltzman has recorded an instance of a woman in whom, after long-continued suppression of menses, the abdomen became gradually elevated from the left hypogastrium towards the corresponding hypochondrium. All the symptoms of ascites were absent and the face was of a pretty good colour. She fell to the ground with some force, and from that period symptoms of ascites commenced, and she soon died. In the abdomen, besides a great quantity of water and pus, a large tumour was found covering the viscera. It consisted of numerous cysts, which varied in size as well as in the matter with which they were filled. The common coat of the tumour had formed membranous adhesions to the contiguous parts, and was united to the uterus.*

Morgagni, lxv. 16.

* When an ovarium becomes the seat of dropsy, the fluid may be chiefly contained in a single cyst, or dispersed through a con-

Hitherto I have exclusively referred to cases respecting which no doubt could be entertained of their being ovarian dropsies. I shall now subjoin some cases in which there was some uncertainty as to their nature.

Brehmius mentions a large sac, full of a watery fluid, and closely attached to the urinary bladder. The patient had been afflicted with the disease four-

siderable number. Sometimes the ovary is wholly converted into a number of cells, which, at one time, are distinct, and at another, they communicate freely. One of the most descriptive cases of ovarian dropsy is related in the Philosophical Transactions, anno 1681. A hundred and twelve pounds of fluid are said to have been found in the ovary, and the appearance resembled that of forty bladders, of different animals, placed together. The cysts, in these cases, contain either a serous fluid, which sometimes is mixed with slimy matter, or they are occupied by a thickropy fluid, or a kind of jelly; and different cysts in the same ovarium will sometimes contain dissimilar fluids, and occasionally masses of solid matter. In general, the disease is slow in its formation, and, as Morgagni has shown, it is for the most part incurable. He has adverted, however, to some instances, in which, at least for a time, the disease appeared to be removed: and the following appears to me an example of spontaneous recovery. About ten years ago, a married lady, somewhat above thirty years of age, who had borne children, consulted me respecting a tumour in the right side, which seemed, unequivocally, to arise from ovarian dropsy. It gradually enlarged, and acquired the bulk of the pregnant uterus at seven months, though chiefly confined to the right side of the abdomen. The functions of the uterus ceased for several years. At length, after an interval of six or seven years, she perceived a more rapid increase of size than had been observed before, and, in process of time, it proved that she was pregnant. She underwent parturition very favourably, and when I saw her twelve months afterwards, the original tumour had nearly disappeared. From the time of labour, some new process commenced by which the deposited fluid had been absorbed. At the time when this circumstance happened she resided at a distance, so that I had not an opportunity of ascertaining whether there were any indications of the cyst having ruptured, and of the fluid having been effused into the abdomen, but this is not improbable.—*Ed.*

teen years. He also describes a case in which the sac was attached to the fundus uteri.

The younger Du Verney met with two instances of a large cyst ascending from the side of the uterus and embracing the ovary.—xxxviii. 65.

Some of the examples of dropsy of the Fallopian tube are unquestionable, but others appear to be of an equivocal nature. Among those respecting which there is no uncertainty, I may refer to one inserted in the *Bibliotheca Anatomica*. The right Fallopian tube was so dilated as to contain a hundred and twelve pints of water. The patient was a maiden, and she had laboured under the disease for eighteen years. The cases of a doubtful nature might have been dropsy of the ovarium, as the description of them is not sufficiently definite.—66.

By attentively collecting the symptoms of encysted dropsies, we shall observe how much they coincide with each other, and also with dropsy of the peritoneum. If the abdomen had possessed considerable bulk for a long time; if the tumour has increased by a slow progress, without occasioning much inconvenience, or much alteration in the colour of the skin; if purging and diuretic medicines afford no alleviation; if the lower limbs have not become anasarctous till the latter period of the disease; we may infer that the woman does not labour under ascites, but is affected with some more circumscribed dropsy. However, it does not follow that she is not the subject of encysted dropsy, should any one of these symptoms be absent.

In reference to the symptoms by which the dropsies in question may be distinguished, I have little to say. There is such a proximity between the ovaria, the tubes, and the ligaments by which they are connected together, and such a necessity for the functions of them all in the process of generation, that

it is impossible to deduce any certain inferences either from the situation of the tumour, or from an imperfection of the generative faculty, which of these parts is dropsical.

When a tumour arises in the situation of the ovary, we may be led to suspect that it is dropsical; but, occasionally, this organ is extremely enlarged in its structure. Gandolphus found each of these bodies equal to the size of a man's head, and of a uniformly compact texture; and one ovary, in another woman, he found much larger, for it weighed fifteen pounds. Nevertheless, when we attentively weigh the symptoms, and deliberate upon all the circumstances which have preceded and which accompany the disease, I think that we shall be able to discriminate between these two affections.—67.

Having adverted to the treatment of dropsy of the peritoneum, I shall subjoin a few remarks relative to the management of those dropsical affections which are included in a sac, and contained in the cavity of the abdomen.

No surgeon was more experienced in the operation of paracentesis than the younger Du Verney, and he expressly denies having ever seen any one cured who was afflicted with an encysted dropsy; but he affirms that he has known many instances of women being carried off in a very short period after the water had been removed, though previously they had experienced no other inconvenience than that which arose from the cumbersomeness of the abdomen, and thus, apparently, they might have lived for a long time. Several other surgeons have witnessed the same catastrophe from paracentesis under these circumstances.

This event is not to be wondered at, if air is admitted to the remaining fluid, or into contact with the membranes, already relaxed, vitiated, or ulce-

rated. The water that has been drawn off a second or a third time, or that issues from the aperture, has been found greatly altered in its quality, and this change has probably arisen from the admission of air. It has been observed green, black, turbid, purulent, feculent, and somewhat bloody; or it has exhaled an offensive odour.

Tulpius saw nine pints of water and pus in the tubes. In the ovaria, Maggi and Dodi found a fetid humour; and Du Verney observed the inner surface of the sac full of abscesses. Even should there be no appearance of pus, no offensive odour, nor any ulceration, yet hydatids are often adherent internally, or the water or other matter is divided into numerous smaller sacs. To draw off all the fluid from the larger sac, which contained all the others, Trew found it necessary to open the membranous septa more than ten times; but it is impossible to discriminate these smaller sacculi, and pierce them, without danger of wounding the intestines. As already observed, innumerable hydatids may be included; the cells, instead of containing water, may be occupied by matter like soft cheese or poultice; or the ovarium also may be scirrhus. Without adverting to other considerations, it will be evident from the preceding observations that paracentesis may not only be useless, but actually injurious to the miserable woman.—68.

Even should there be only one sac, and that not divided by septa, not containing abscesses nor tumours, nor occupied by cells containing a diversity of matter, the propriety of paracentesis is extremely doubtful. It has been found that omentum, intestine, or some other viscus, may intervene, or a part of the fluid may escape into the cavity of the abdomen. Gangrene or suppuration in the sac has been apprehended, or it has been feared that the

fluid will accumulate again, as it does in other follicular tumours.

Whilst revising these observations, a case occurred to me in which the sac burst during a violent fit of laughter, by which the abdomen was violently agitated. The patient was conscious of the disruption, and immediately the tumour became softer. She felt an unusual weight in the lower part of the abdomen, with a sense of fluctuation, which had never existed before, and she also observed a sensation of weight falling to that side on which she turned herself. By the aid of remedies a copious discharge of serum from the kidneys and intestines was obtained, and the symptoms disappeared, so that, during fifteen days, she appeared to enjoy perfect health. However, from that period the tumour again arose, and acquired its previous bulk and tension. She retained, as before, a healthy countenance, her feet were not tumid, and, indeed, she was active, robust, and in good health, with the exception that some parts of the abdomen were occasionally uneasy, that she was encumbered by the bulk of the abdomen, and the catamenial flux diminished. In order that the cyst, therefore, after discharging its original fluid, should not again become distended by a fresh accumulation, it is necessary to destroy or extirpate it, as is done with external follicles. The first of these operations, on a large sac among the viscera, certainly could not be borne. The second, indeed, has been proposed by some practitioners who were encouraged by the well-known but extraordinary cure effected by Abr. Cyprianus; but whether any one has made the attempt within these thirty years since it was proposed I cannot determine. If it were certain that the cyst had but one root, and that a small one, a ligature might be placed round it without much

difficulty, but if it were adherent to other parts, or attached by a broad basis, what could be done? —69.

If asked whether we can indulge no hopes of curing an internal encysted dropsy, I reply, that the younger Du Verney supposed he had been successful in curing a maiden, in whom, after drawing off the water, he imagined that the parietes of the cyst had coalesced. And in another case an immunity was obtained for two years. But these might possibly have been instances of peritoneal dropsy, especially as he has distinctly stated that he never witnessed a recovery when it was certain that the dropsy had been encysted.—70.

Probably it will be preferable to adopt only palliative means till we are taught some more certain method of cure than we possess at present. It is proper to avoid those motions or postures of the body which may cause the cyst to press greatly on the viscera, or the viscera on the cyst. That the sac might easily be ruptured has been shown by its having occurred from violent laughter. Powerful expedients, such as emetics and purgatives, should be avoided; for there are cases on record which render it probable that the cyst has ruptured in the act of vomiting.—71.

I believe that no rational expectation of curing encysted dropsies can be entertained, except when some accidental circumstances conspire with the efforts of nature to promote that desirable issue. Villus relates a case in which the patient was thus fortunate. After labouring fourteen years under extreme bulkiness of the abdomen, the woman fell upon that part. She perceived a cracking noise in the left epigastric region similar to that of the bursting of a drum, and she began to discharge, at intervals, vast quantities of inodorous urine. The

tumefaction of the abdomen vanished within nine days, and she soon recovered a state of good health.

Morgagni, lxxv. 18.

In the body of a man who for two years had been considered ascitic, Weszpremuis found an enormous cyst, the neck of which was implanted between the bladder and rectum, and the remaining portion was connected to the adjacent parts by means of cellular substance. It was filled with fluid, which exhaled a powerful odour, and in which large hydatids floated.*—lxxv. 16.

Ovaria containing hair.

Hairs have been found in the ovaria on many occasions, and cases have been described by Bauhin, Blasius, Wepfer, Veronicus, Stalpart, Haller, and others. Fifty-three years ago an instance occurred to Manfredi, concerning which he communicated to me the following particulars. The tumour was of a globular figure, the size of a large egg, and attached to the right ovary. It was invested with a white and almost cartilaginous coat, which in some places was pretty thin and of a blackish colour. Within this globe a ball of hairs, was concealed. These hairs were quite disjoined from the coat, and were smeared over with a substance which resembled suet. Within the conglomerated hairs, too, there was a kind of nucleus, from which some vessels proceeded into the continued substance of the ovarium. I do not recollect that vessels and a nucleus resembling these mentioned by Manfredi have been observed by other anatomists; nor do I remember that any other surgeon has witnessed the

* Although Morgagni has placed this case among encysted dropsies, I apprehend that it was a large hydatid cyst.—*Ed.*

circumstances remarked by Bauhin, namely white hairs fixed in the surrounding coat, but none on the pubis, though the woman had passed the age of puberty and even borne a child.

Whilst revising this letter I met with a programme entitled *De Ovarii Tumore Piloso*, published at Leipsic in 1735, by P. G. Schacherus, who not only mentions other observers of hairs, and of fatty matter, in the ovaria of women, especially on the right side, but he describes the same appearance as having been found by him in the left ovary, which was considerably enlarged. He describes the hairs as having proceeded from the inner surface of the thickened coat. Targioni saw these hairs inherent by one of their heads in the thick and tenacious coat, precisely as they grow upon the skin. From what cause these hairs are found within the ovary, if they really are hairs, is difficult to explain; but the difficulty is not greater than in accounting for their generation within other parts. Cornelius Celsus mentions that in tumours of the thyroid gland, hairs mixed with small bones are sometimes included; and others quoted by Heister have seen them in various places. I have already related that I once found hairs within the transverse process of the dura mater.—*Morgagni*, xxxix. 41.

Malformations in both sexes.

Valsalva has related the case of a man who was dumb, without an imperfection in the faculty of hearing. He had no hairs upon his face, breast, axillæ, or on the scrotum; and, on the pubis, there were only a few scattered hairs at the root of the penis. He died of acute fever at the age of thirty-five. All the organs of generation were attentively examined, but they exhibited no trace of defective structure.—*Morgagni*, xlvi. 2.

Valsalva has not stated whether this man had the generative faculty or not, nor has he said that he was without hairs from birth; but it is probable that this was the case, and that he was led to examine the parts of generation on that account. As there was no apparent deficiency in those parts, this observation appears to imply that the cause by which the semen is rendered capable of fœcundation, and by which the body becomes hairy, must exist in the invisible structure of the parts by which the seminal fluid is secreted or perfected. We certainly observe both these circumstances happen together at the time of puberty, that is, when these internal structures begin to be sufficiently developed.

Some very slight appearances in the cutis of women, if they had existed from birth, and been perpetual, have sometimes convinced me of their sterility. I have seen three women in whom there was nothing which did not promise fœcundity, yet, though married to men enjoying excellent health, they were barren. In one of them, contrary to what would have been supposed from her kind of life, age, and habit of body, I found the skin by no means smooth and soft; and in the other two the cuticle was constantly falling off in scales and scurf.—3.

In an infant six months old, the left ovary and Fallopian tube were found within the sinus by which the ligamentum teres of the uterus passes out of the pelvis.—lxvii. 2.

SECTION VI.

UTERO-GESTATION.

Unnatural phenomena in relation to pregnancy and labour; and malformation and disease of the fœtus and secundines.

Medical practitioners not very unfrequently mistake true pregnancy for a false conception, or moles for genuine impregnation. The symptom of natural pregnancy derived from the motion of the fœtus in utero is unequivocal; and whoever has once clearly perceived its movements by applying his hand to the abdomen, will never be imposed upon by flatus in the intestines, nor by any other motion. The movements of the living fœtus are totally unlike every other motion. In the early months this symptom does not exist, and sometimes the other evidences of pregnancy are likewise absent. Even in the latter months the movement in question may be imperceptible, from the weakness of the fœtus, or some other cause. I recollect having been consulted respecting a young woman from whose breast a tumour had been extirpated. From the period at which this operation was performed, the abdomen began to protuberate, and it continued enlarging till the time of my visit, when nine months had elapsed. The mammary tumour had been considered of a cancerous nature, and suspicion was entertained that the same disease had affected the uterus. I carefully examined the abdomen, and the uterus seemed to be pregnant, but I perceived no motion. The presence of the relatives did not allow me to dip my heated hand in cold water, as I should otherwise have done, for by a cold hand the fœtal movement is generally

excited. I therefore recommended her physician to act with caution, though every one supposed the patient to be in a state of virginity. Soon afterwards, however, she was delivered of a child.

A protuberance of the navel has been mentioned as another sign of pregnancy, but this is equivocal, as it frequently accompanies ascites, and other tumours by which the intestines are forced upwards. Some women, indeed, uniformly become dropsical when they are breeding, and much care is necessary to distinguish the pregnancy before violent measures are adopted to remove the hydropic affection.

There are many, likewise, who rely upon a symptom proposed in the Aphorisms of Hippocrates. He says—*Quæ utero gerunt, his uteri os comprimitur.* This indication certainly is useful within the early months, when that which is demonstrative cannot appear, and I have successfully availed myself of it; but the opportunity has not often been allowed, because the women of this country are generally averse to such examinations. However, it is necessary to be cautious on this point, because there are diseases of the uterus in which the osculum is closed.

For the same reason I did not think it sufficient if, with some constriction of the orifice, an extension of the corona was perceptible; or if the weight of the uterus, felt whilst the woman stood erect, appeared to be increased; or if the orifice was directed backwards. For, although, when the symptom first mentioned exists, these circumstances afford corroborative evidence of pregnancy, yet I apprehend that no great reliance can be placed upon them, unless there is an immunity from all the symptoms of disease in the uterus.—*Morgagni*, xlviii. 3.

If the woman has previously been pregnant, inquiry should be instituted whether the symptoms now

resemble those which then indicated utero-gestation. From a disregard to this circumstance, (and indeed it is sometimes fallacious,) I have known physicians err; and this will be demonstrated by the three following cases.—4.

CASE 1.

The evidence of utero-gestation suspended by hæmorrhage.

A married woman became pregnant, and experienced inconveniences similar to those which had accompanied former conceptions; consequently she entertained no doubt respecting her situation. About the third month the enlargement of the uterus became perceptible, and at the same period a great quantity of blood was effused from the hæmorrhoidal vessels. The abdominal fulness considerably abated, from which circumstance it was supposed that the woman had been deceived; and though, on the cessation of hæmorrhage, the abdomen began again to tumify, utero-gestation was not suspected. At length she had a recurrence of hæmorrhage, accompanied with fever, and then she herself, as well as her physicians, relinquished every idea of pregnancy. Blood was abstracted from the arm, and afterwards from the foot, and purgatives were administered. However, a few hours only had elapsed after she had taken these medicines, when a dead fœtus was extruded. The following morning, August 29, 1727, the fœtus and secundines were brought to me. Its length was six digits, and that of the funis umbilicalis was nine, but the latter was so exceedingly slender as to resemble a thread of moderate thickness. The body was well formed, and at the time of being expelled it was of a white colour; but when brought to me it had become brown. Nearly all the viscera

exhibited a pallid and decayed colour, and the liver especially, was of an excessively pale yellow. The urinary bladder and the large intestines were empty.

Whatever part of the fœtus or of the funis was cut into, no blood, nor even a tinge of blood, was discoverable, but oblong cells containing black and almost fluid blood were apparent through the membranous surface of the placenta, which was very large in proportion to the size of the fœtus.

Though the body of the fœtus was neither flaccid externally, nor covered with rugose integuments, and although neither it nor the secundines exhaled an offensive odour, yet unquestionably it had remained a considerable time dead in utero. Other instances, as well as this, demonstrate that a dead fœtus may be retained even for several months without putrefaction, and without yielding any disagreeable smell.

Morgagni, xlviii. 5.

The sudden effusion of a large quantity of blood had rendered the fœtus and its funis exsanguis, and had reduced the latter to its state of extreme exility. However, as there was supposed to be no fœtus in this case the mistake of the physicians was somewhat more excusable than in the following instance.—6.

CASE 2.

Absence of the demonstrative symptoms of utero-gestation in consequence of bleeding.

A woman supposed herself pregnant, and was sanctioned in this opinion by her usual symptoms. The physician entertained an opinion that she was plethoric, and abstracted a pound of blood from the arm. After this depletion the enlargement of the abdomen was not proportionate to the advancing stages of utero-gestation; nor did the woman distin-

guish the motion of the fœtus, at the usual time, therefore the physician expressed a decided opinion that the womb did not entertain a fœtus, but a false conception. Alarmed by this statement, she requested my opinion without communicating any thing which had transpired with her physician. Her countenance was healthy, and in every respect she experienced sensations resembling those attendant upon former pregnancies except in the two points just named. Under these circumstances I pronounced that she was with child, and that the detraction of so large a quantity of blood had diminished the strength of the fœtus, and retarded its growth. I also intimated that as the fœtus was in so languid a state, unless the mother recruited by a proper method of living, accompanied with cheerfulness of mind, she was in great danger of not completing the term of uterogestation. These opinions proved to be correct, but the advice was inculcated too late, for having departed into the country, a bloody discharge came on at the expiration of a few days, pains followed, and a dead fœtus was expelled at the time of voiding feces. The fœtus was slender and not offensive in smell—*Morgagni*, xlviii. 7.

Physicians who commit an error of judgment are entitled to forgiveness provided they do not join contumacy with their mistake, as he did to whom I have alluded in the foregoing detail ; but, in the same place, I met with a much more tractable practitioner, who attended the individual to whom the following particulars refer. The case occurred in 1721.—8.

CASE 3.

Abortion ; the ovum accompanied by a flesh-like concretion.

A fœtus was expelled in an immature and lifeless

state, and the case deserves greater accuracy of detail, because a mole was thrown off at the same time.

The subject of this abortion was a matron of a moderately good habit of body, and of a middling size, but having a disposition to sanguineous plethora. She was the happy mother of numerous progeny, and she had also occasionally miscarried. After her last delivery, which was followed by excessive lochial discharge, she passed the winter in a very dejected state of mind. In April, from the ordinary symptoms, joined with suppression of menses, she supposed that she had again conceived. These symptoms were followed by so great a loss of appetite, that, in general, she could only eat in the evening, and then with difficulty; whatever food she took in the morning was vomited. About the thirteenth of June uterine hæmorrhage came on, and the measures adopted to suppress it were unavailing. I was consulted about the middle of July, when the discharge continued; but it chiefly flowed in the night, whilst she either lay supine or upon the left side. Besides that discharged in the night a large quantity of coagulated blood came away when she first arose, but afterwards, during the day, whether she sat or walked, or was conducted about the city in a carriage, she lost little blood.

Whilst labouring under these circumstances, an unexpected misfortune, which befel her husband, proved a violent cause of additional grief. On the first night, indeed, after this calamity, there was almost a cessation of hæmorrhage, but during succeeding nights it flowed more plentifully than before. In consequence of such profuse and frequent effusions of blood, no person believed it possible that the uterus could be in a gravid state, and the patient herself ceased to cherish that opinion.

Nevertheless, I frequently intimated to the phy-

sician that in reference to a woman who abounded so much with blood, it was necessary for us to suspend our opinion. I reminded him also that all the usual signs of pregnancy had preceded, and that no trace of abortion had been discovered. As her general strength was somewhat impaired, and the former measures had not succeeded in moderating the discharge, sulphuric acid was administered. Her appetite improved, and a much smaller quantity of blood was discharged. It was now the end of August, and the mammæ became tumid as in former pregnancies, so that the patient herself, as well as others, inclined again to the idea of pregnancy which had been relinquished.

She frequently experienced an unusual pricking sensation in the uterus, which distressed her mind, and I desired to examine the abdomen accurately with my hand. On doing this my uneasiness increased, as I perceived that the uterus was not acuminate towards the umbilicus, but extended transversely, and was painful on pressure, especially in the right iliac region; and on this ground I expressed to her husband, and to the physician, that there appeared to be a false conception *in utero*, as well as a fœtus. However, I directed that the same plan of treatment should be pursued, avoiding powerful stimulants and astringents, moderating the hæmorrhage, preserving the woman's strength by maintaining quietude of mind and body, and administering proper nutriment.

A few days afterwards, while the woman was erect, the membranes suddenly ruptured, and the water did not differ from that usually discharged in labour, but the quantity was somewhat redundant. On examination, the os uteri was found closed, we therefore waited for labour pains, which did not commence till the fourth day. The mola was first

expelled, and afterwards a lifeless fœtus. An interval of three hours elapsed before the secundines came away, and their ejection was accomplished with difficulty, and attended with considerable effusion of blood. The patient, however, recovered, and survived twenty-nine years, when she died of ulceration of the uterus and vagina—a disease which commenced only within a few years.

Hartman and Gutterman have related cases in which the natural ovum was accompanied with a false conception; and in them abortion had long been preceded by copious hæmorrhages.

When the mola had been washed from the blood which adhered to it, its thickness did not exceed two digits, but it was somewhat longer, and when cut into it presented a rather spongy and fleshy appearance. The fœtus was of the female sex, and was not quite nine digits in length; the head and neck were blackish, as if from a contusion, but its smell was not offensive. I was only permitted to open the abdomen, and the chief motive for ceding to me this privilege was, that I might examine the organs of generation, for, owing to the prominence of the clitoris, which at this age usually covers the rimula, the distress of the parents was aggravated under an idea of having been bereft of a son.

Morgagni, xlviii. 9.

The waters which in this case preceded the labour pains, undoubtedly proceeded from the amnion, but sometimes water escapes which I believe had accumulated between the chorion and amnion, and the discharge of it is uninjurious. The membranes rupturing too early is not uniformly followed by a difficult labour, though, in general, the progress is less favourable than it would otherwise have been, whether this be considered as cause or effect.—10.

Molæ, or false conceptions.

Both the true and spurious molæ may be joined with a fœtus, and may cause abortion either by irritating the uterus, or by occupying a very considerable part of its cavity; or they may form independently of impregnation, and enlarge to such a degree as to resemble pregnancy. The illegitimate or spurious may be produced in the virgin uterus; the legitimate or true cannot take place without previous sexual intercourse.

The spurious are formed from extravasated blood coagulating and lodging in the cavity of the uterus, or from some excrescence. When they arise from the latter source, they are known by a base or peduncle, by which they had been continued from the uterus, or, at least, from the blood-vessels which shoot into them. Those of the former species much more frequently occur than those of the latter, and they originate in the same way as concretions in the vessels and heart. They are most likely to form in females whose catamenia are copious, or who are the subjects of uterine hæmorrhages. But before I amplify on the subject of moles, I shall detail a case in which the polypous concretions which formed in the uterus were of a remarkable description.—11.

CASE 4.

Membraniform substances discharged during menstruation.

An illustrious matron in my native country, who possessed a healthy countenance, and a good habit of body, miscarried several times in the early months of pregnancy. Within the intervals of these abor-

tions she had often completed the term of utero-gestation, and produced living offspring, and even twins, but not without troublesome labours. Between these parturient seasons she generally was affected with a mild form of leucorrhœa, and about the time equidistant from the menstrual periods, she also had a slight stillicidium of blood, which the conjugal embrace renewed.

When she had passed her thirty-fourth year the leucorrhœa ceased, but she became the subject of another form of disease, which, during two years, recurred, at intervals, and in the last three months of the year 1723, and the first month of the following year, it accompanied menstruation. At those periods she suffered pains resembling those of labour, and the discharge was more copious than usual; and about the middle of its course, a substance resembling a portion of membrane was ejected from the uterus. Its form and magnitude perfectly corresponded with the cavity of that organ. It was moderately convex externally, and there were numerous filaments that appeared to have been broken off from the parts to which they had adhered. Internally the substance was hollow; and this surface was smooth and moist, as if an aqueous fluid had occupied it. Its ejection was followed by a great quantity of lochia; and whenever it was divided into small pieces and thrown off at different times, the pain and lochial discharge were repeated. During the four months alluded to she was separated from her husband, but in March she became pregnant, though she did not carry the fœtus beyond June. However, the consequence of this conception was that in the three following months, her catamenia flowed naturally and without uneasiness. In October she did not menstruate, and about the beginning of November the pains returned and were accompanied with the expulsion of a body similar to that which has been

described, and with all its attendant circumstances. The phenomena long continued to recur at stated intervals, and when I visited Forli, in one of the following years, I saw a substance which had been expelled, consisting of a concretion in form of a triangular purse.

At length the disease ceased spontaneously on account of the patient's advanced age; for when a cessation of the menses occurred, the morbid productions ceased also, without leaving any symptom of erosion in the uterus, nor was any other inconvenience felt during the remainder of life, which was protracted to the age of seventy.

Morgagni, xlviii. 12.

Conformably with my promise I shall add a few remarks relative to the true molæ. The most learned men of the present age all denominate those true moles which cannot be produced independently of a previous conception. Some believe that they may be a production of the fœtus and secundines, others of the placenta only, if from any cause the appearance of these parts is so altered that they represent a kind of fleshy mass, or a mass exceeding the solidity of animal substance, or a congeries of vesicles.

Ruysch has demonstrated that in the placenta both these conversions may happen. He intimates that the placentulæ of very small fœtuses frequently remain in the uterus, and being compressed by that organ, their figure becomes essentially altered, and their substance resembles the hardest flesh. He also met with a placenta, at a more advanced period, which had partly degenerated into vesicles full of a watery fluid. But they do not exclusively belong to the placenta, for Ruysch many times saw a vesicle in the funis umbilicalis, and sometimes he saw the chord so full of vesiculæ, *ut totus [funiculus] videretur*, says he, *concatenatio vesicularum aqueo humore*

refertarum. An instance occurred to Vallisneri in which a placenta was discharged from the uterus after a vast number of vesicles, so that unless we suppose them to have belonged to another fœtus they do not appear to have been formed from conversion of the placenta; and the same inference may be drawn from the observations of others, for instance, those of Guttermann.

It may be doubted whether the degeneracy of the placenta into vesicles is effected after the expulsion of the fœtus, or whilst it remains in utero. I may observe on this subject that in the placenta of a fœtus of four months, which had been extruded with the fœtus, I saw a vesicle full of water.

Though it has been stated above, that neither of these kinds of molæ is produced independently of conception, and therefore certainly not in the virgin, yet the utmost skill and attention are requisite in their examination. Nor is prudence in giving an opinion less necessary if a woman, said to have had no sexual intercourse, should discharge a body from the uterus, which, at first sight, may appear to belong to one of these species. It perhaps might not be a placenta but a mere concretion of blood, or some excrescence which resembled flesh, or the vesicles of which I have spoken in a former article.

In speaking of dropsy of the uterus it is mentioned that the disease has been removed by the expulsion of a great quantity of hydatids, and although this has happened at a very advanced age, it has been imputed to retention of the placenta. Rideux has described a case in which, though the mola was of a different description, he considered it attributable to the same cause. It was expelled by a widow in the seventy-fourth year of her age, and he believed that it had been conceived in her fifty-fourth year, when she experienced a sudden cessation of the catamenia,

which up to that period had been perfectly regular. This individual bore her ninth child in the fifty-first year of her life.

It may admit of consideration whether in this way we may, in some measure, explain the facts related by Vallisneri, respecting a woman who was the mother of many children, the last of which she bore when she was supposed to be nearly fifty years of age. In her seventy-second year she discharged a placenta from the uterus, to which a shapeless mass of flesh, a pound in weight, was attached. At the upper part there was a resemblance of a small eye; and in the interior there were convolutions similar to those of foetal intestines.

We may infer from the preceding observations that should any thing be discharged from the uterus of a widow, which either approaches the nature of a true mole, or which really is a mole of that description, we must not immediately doubt her chastity, though her husband may long have been dead. For, as has been already observed, the placentula might have remained in the uterus after an abortion which had scarcely been observed. And although this cannot happen in the virgin state, we must seriously deliberate upon all the circumstances to guard against deception. Fleshy excrescences may form; and concretions of blood often present appearances of vascularity—sometimes they appear to contain fatty substance—and Hartmann observed in one of them not only a resemblance of many coats intermixed with fibres and vessels, but also of an adipose cuticle; and a vesicle containing jelly occupied the interior of the concretion. Schlierbachius saw a mole in some degree vascular, and at the same time filled with copious hydatids, which appeared to be intermingled with a large quantity of fat. Therefore we must carefully distinguish organic structures

from substances which merely resemble them, for genuine fibres, vessels, coats, and an investing bladder cannot exist without the interposition of man. Indeed a bladder of this kind would be the most legitimate of all molæ as it is the involucrum of an embryo. This, therefore, cannot exist in virgins; nor, so far as I know, that which might be called *mola vesicularis*, (consisting of vesicles clustered like grapes), of which I have already treated.—13.

Abortion.

I have already detailed three cases of abortion, and shall now speak on this subject very concisely. Indeed, it would be an endless task to recount all the causes of this occurrence derived from the fœtus and secundines, or from diseases in the mother. Some of the morbid appearances presented by the placenta have been described, I shall therefore now only advert to such as are either the cause of abortion, or which render that abortion dangerous.

Thickening and induration of the placenta undoubtedly occasion miscarriages. Its increased bulk renders the space within the uterus too narrow for the fœtus; and, in consequence of its hardness, the fœtus is deprived of nutriment and perishes—a circumstance which Abraham Vater saw confirmed by an observation of scirrhus placenta. It has been thought, that, when the fœtus is dead, if the placenta remain in the uterus and adhere to that organ, it may itself receive nutriment from the uterus, and, by that means, become still thicker than it was before; but on the contrary, there are cases in which, on account of the supply of nutriment being intercepted, both the placenta and fœtus are surprisingly extenuated. This fact has been partially shown by the observations of Hoyerus and Moekringius, but it

is more clearly evinced in the following instance, which was communicated to me by a friend.—17.

CASE 5.

Abortion from grief.

A woman, just entering the fifth month of pregnancy, was abruptly informed of her husband's decease, and this intelligence instantly overwhelmed her with grief and terror. At first she observed that the movements of the fœtus were languid—afterwards they ceased entirely—and she miscarried on the eighth day subsequent to the cessation of motion.

The placenta and the dead fœtus, as well as the funis umbilicalis, were surprisingly slender. The fœtus was white, and though there was an appearance of vessels in the funis, they were nearly dry.

Morgagni, xlviii. 18.

We learn from Stahl that abortion, which arises from other causes besides mental emotion, often recurs about the same period of utero-gestation as it happened before; and he informs us also, that this recurrence has been counteracted by proper expedients. I recollect no instance, however, in which the premature expulsions of the ovum were more numerous than in that related by Schulzius. The first miscarriage was brought on by a sudden and powerful affection of the mind three months after conception, and twenty-three times it recurred at about the same period, though every mean likely to prevent it was employed.

These cases show the influence which passions of the mind exert in exciting abortion. In the case related by me, I believe that fluids were readily carried from the fœtus and placenta to the mother, but those passing from the mother to the ovum were

not conveyed without difficulty, as, in consequence of her distressed state of mind, the mother was incapable of transmitting to the gravid uterus a sufficient supply of nutriment.

On the contrary, the extreme tubuli of the placenta and the uterus having contracted from the sudden chill of death, blood has been obstructed in its return from fœtuses that were in other respects healthy. This blood having accumulated in the liver, that viscus had become greatly distended, and blood had ultimately been effused into the cavity of the abdomen.—19.

I have observed this circumstance in fœtal calves, when the cows had been killed in an early stage of impregnation; but I do not know whether it is liable to happen to fœtuses more advanced.—20. 22.

Certainly those injuries which the fœtus sustains from the hardness of the placenta are only observed in the early months of utero-gestation, unless the placenta should become universally hard, or be rendered unfit for its office in some other way. I think there can be no reason to doubt that the same cause by which a part of the placenta is vitiated may occasion more extensive lesion in this substance.

The subjoined observations will show what has fallen under my notice on this subject.—22.

CASE 6.

Disease in the placenta ; morbid softness of texture in the fœtal liver and kidneys.

In June 1731, a mature fœtus, whose movements the mother had not perceived for two days, was born dead.

Dissection. When I inspected the hollow surface of the placenta, I observed within its substance, at the distance of two digits from the insertion of the

funis, a body of a whitish yellow colour; and when cut into it appeared as if it were compacted of thick membranes, laid one upon another. It was not larger than the last joint of my little finger, therefore we could not impute the death of the fœtus to it. Nor did it appear sufficient to account for the viscera being so extremely soft, that not only the liver became fluid by a mere touch, but, the coat of the kidneys being divided, the substance was effused under the appearance of red poultice.—*Morgagni*, *xlvi*. 23.

CASE 7.

Disease in the placenta.

Twins that were healthy and lively were born at the proper time in June 1740.

On examining the secundines attentively, one of the placentæ, not far from its edge, exhibited a white body the diameter of my thumb, proceeding from the convex to the concave surface, so that it was equally visible from both surfaces. There was a similar body on the other placenta, but it did not exceed the size of a vetch.—*Morgagni*, *xlvi*. 24.

Though the twins were equally healthy, there is no doubt that the substances observed in the placenta were the result of disease, and, in conjunction with the facts before-mentioned, they show that the placenta is liable to more than one description of lesion, besides those more familiar to common people.

Should this disease extend itself to a considerable degree, there appears no reason to doubt that it may be a cause of abortion, and of the death of the fœtus. From scirrhus of the placenta this catastrophe generally results; and, probably, in process of time, the morbid changes observed by me would have degenerated into that state. Fickius saw the substance of the placenta so scirrhus as to be incapable of per-

forming its functions ; and Albrechtus witnessed small tumours scattered through the placenta. Internally they were of a whitish colour, very similar to scirrhus glands ; and in their interstices, about the origin of the funis, there was an hydatid full of a yellowish humour. In a corresponding situation Roderer saw a larger vesicle, the fundus of which consisted of the substance of the placenta, and was full of a rather soft scirrhus.

The funis umbilicalis may be a cause of abortion, not only from being corrupted, but also from an excess of thickness or thinness, of shortness or of length. An example of the first and second cause is noticed by Ruysch, who describes the first as being not very unfrequent. Examples of the other causes are recorded in the *Sepulchretum*. Litre has related an instance in which the funis was so contorted that it not only was reduced one half in thickness, but was equally diminished in length. A funis that is very long is liable to be convoluted in the form of a halter, or to be knotted so as to constrict its own vessels and obstruct the circulation in it.—25.

I shall cursorily advert to some other affections from which the lives of aborting women are endangered. In the first months of utero-gestation the placenta is very small, but having a large quantity of blood adhering to them when expelled at the time of an abortion, they appear larger than they really are. Physicians who do not attend to this circumstance, expect a foetus corresponding in size with the placenta, but, if one had existed, probably it might have escaped imperceptibly in consequence of its diminutive size, or it might have been dissolved. Besides, the placenta may actually increase to an unnatural bulk after the little foetus is dead, and, on that account, more likely to elude observation.

When deception has happened, medicines have been administered with the vain intention of expelling the foetus, to the serious detriment of the mother.—26.

Unnaturally close adhesion of the placenta to the uterus is another circumstance much more perilous than that just noticed. The following instance exemplifies the danger attendant upon this occurrence.

CASE 8.

Retention of the placenta.

A pregnant woman, thirty-three years of age, having repeatedly lifted a heavy weight, expelled the foetus at the expiration of seven or eight months, but the secundines did not follow. The next day she was seized with rigour and fever, which progressively increased, and a few days afterwards difficulty of respiration was conjoined with the febrile symptoms. Matter, extremely offensive, was discharged from the genital organs, with some portions of the secundines. Ultimately the patient was seized with convulsions and hiccough, the abdomen became exceedingly tumid, and she died on the eleventh day after delivery.

Dissection. The intestines and stomach were found to be so full of flatus, that the latter organ occupied four times as much space as it usually does in the natural state. On opening the uterus a large portion of the placenta offered itself to view. Part of it protruded through the os uteri, and another part was so closely attached to the uterus that it could scarcely be separated even with the aid of the scalpel. This portion was condensed into a very hard and extremely fetid body. That part of the uterus to which it adhered was the seat of inflammation, which penetrated rather deeply, and also extended through the remainder of the inner surface, though its degree was slight.—*Valsalva*, xlviii. 23.

Ruysch has admonished us not to be over hasty to extract the placenta when it is attached to the uterus, nor, indeed, did he or his followers want examples of very serious mischief, and even of death having ensued from the violence of a hasty extraction. However, we likewise observe the evils which arise from adhesion of the placenta to the uterus, and its being retained. Though I do not presume to settle the controversies which have been agitated among our countrymen on this point, there is the utmost occasion for experience and prudence, according to the exigency of the case, to prevent us from violating either of the precepts of Celsus.—He says, *satiùs esse anceps auxilium experiri, quam nullum*: also, *nec subire speciem ejus vi occisæ, quam sors ipsius interemit*. The most considerate men are afraid of violence, and, after weighing the arguments on both sides, they agree that it is the best practice to wait a little.

It has been repeatedly observed that removal of the woman from one place to another, has occasioned the expulsion of the secundines. More than once I have seen this happen whilst she was carried from the obstetrical chair to the bed. Midwives who urge women to violent exertions to expel the placenta as soon as slight pains have commenced, often occasion serious evil. For nature, gradually adapting all things for an easy delivery, disposes the connexion between the uterus and placenta for their more easy disjunction; but if time is not allowed, the quantity of blood accumulated around the placenta, renders the detachment more difficult.*—29.

* The safe delivery of the placenta is a very important part of obstetric practice, and various causes occur to prevent its expulsion within the usual time. It may be retained from a deficiency of contractile power in the uterus—from its irregular contraction, constituting what is denominated the hour-glass

Impropriety of rupturing the membranes prematurely.

When the membranes are so thick and firm as to retard the birth, their laceration may be necessary, but midwives are exceedingly reprehensible when they are so impatient as to rupture them without absolute necessity. In consequence of a premature effusion of the liquor amnii, it often happens that the labour, instead of being an easy and natural one, becomes protracted. Sometimes these officious practitioners render a labour fatal, when without improper interference it might only have been a difficult one. Encouraging the patient to fruitless exertions, and administering articles which excite the uterus to vehement contractions, or, at least, which stimulate the vascular and nervous systems, will have a tendency to induce a fatal termination. This observation will apply to those cases in which the passages are not sufficiently dilated either in consequence of its being the first labour and the woman advanced in life, or because the pelvis is narrow. It is also applicable to cases in which the capacity of the pelvis is diminished by tumours, and also to those in which the foetus does not present favourably for its expul-

contraction—and from organic lesions, affecting the uterus and placenta, and occasioning morbid adhesion between them. It is probable that, in general, this is the result of adhesive inflammation. The inner surface of the uterus, when inflamed, manifests a considerable tendency to the effusion of coagulable lymph, and if inflammatory action should arise, where the placenta is attached, during utero-gestation, lymph may be thrown out and become organized, and in this way occasion unnatural firmness of union between the parts in question. However, Morgagni has very properly adverted to the effects of mismanagement, and undoubtedly, many of the anomalous occurrences relating to the foetus and placenta, which attend labour, and often endanger the patient's life, are owing to the culpable officiousness of the accoucheur.—*Ed.*

sion. Under these circumstances the foetus cannot be propelled through the natural passages, and from the improper treatment which has been adverted to, the uterus may rupture, and the child escape into the abdomen.

The rupture of the uterus is a more frequent occurrence than many suppose, and as the child does not invariably escape into the abdominal cavity, this laceration should be placed among the other causes of unexpected death occurring soon after delivery.—30.

The indirect position of the foetus is one cause of rupture of the uterus, and this obliquity generally happens from the same inclination of the uterus itself. Deventer has shown how important it is to distinguish the situation of the uterus by examining the os uteri in parturient women; because difficult labours often arise from the obliqueness of the womb.—31.

Sometimes parturition is rendered dangerous from a concurrence of several causes. Besides those alluded to, the cervix uteri may be obstructed by an excrescence, the os uteri may have acquired the hardness of cartilage, or the funis umbilicalis may be extremely short, a circumstance which might occasion the placenta to separate too early, or the funis itself might be broken. On one occasion Stegmanus saw the funis scarcely six digits in length.

Indeed the sources of difficulty on these occasions are innumerable, and it will be proper to speak of one of the principal ones, namely, the death of the foetus, because it is a very frequent cause.—39.

The first difficulty which presents itself here is, to determine that the foetus is actually dead. The discharge of meconium has been regarded as one of the signs, but this may arise from an unnatural position of the foetus, so that its abdominal parietes be-

ing compressed, the resistance of the sphincter ani is easily overcome. It has been supposed that the want of pulsation in the umbilical chord may be considered as an indication of the death of the fœtus. The pulsations in the fingers of the surgeon are liable to render this circumstance fallacious. It may occasionally be useful for the practitioner to compare the number of pulsations with those of his own radial artery; so that if they coincide, he may be certain that the pulsation which seemed to be in the funis, is in his own digital arteries. Nor, indeed, must it be immediately inferred that the fœtus is dead, though pulsation is imperceptible; for at one period the fœtus may be exceedingly languid, but it may soon regain its strength. Coldness and lividness of a limb which may protrude, and the imperceptibility of its pulsations are not sufficient proofs of the child's life being extinct. The limb may be so compressed by the contracted os uteri, that gangrene may commence, and the cuticle begin to separate, without its being certain that life is extinguished, though it must be considered in the utmost danger. At Breslaw a protruding arm was amputated, because, in consequence of the lividness and coldness of the limb, it was supposed that the fœtus was dead; nevertheless on the third day it was born alive.—40.

Among the most decisive evidences of the death of the fœtus must be enumerated the very easy separation of the cuticle, and the escape of matter from the uterus having a cadaverous odour.

When from the concurrence of evident causes with the more characteristic symptoms, practitioners agree that death has taken place, some perplexity arises in determining whether the fœtus should be extracted immediately, or whether the result of other means should be waited for. Though our plans must vary according to circumstances, it is scarcely possible to

avoid censure, in the use of a doubtful expedient, unless we act in concord with the prevailing opinions of the most distinguished practitioners, especially if the advantage of skilful and experienced consultation cannot be obtained.

It is not sufficient to save the life of the patient, but we must guard against injury to the uterus.

Some years ago I was consulted respecting a lady who four times underwent parturition very satisfactorily. In the fifth she had occasion for assistance, and though the surgeon ought to have extracted the infant by the feet, as they presented, yet he pushed them upwards, and endeavoured to turn the head to the uterine orifice. The patient was a delicate woman, and having been exceedingly distressed by the long-continued and violent efforts of the surgeon, dangerous inflammatory fever subsequently came on, and in the three following births the hand presented itself instead of the head. It is probable that this unnatural presentation was owing to an injury sustained by a particular part of the uterus, which prevented this organ from supporting or expelling the foetus equally.

Therefore, if there are no circumstances which demand an expeditious delivery, and the position of the foetus is not unfavourable, in my opinion time should be allowed; and during uterine action it is sometimes useful to assist the exertions of the mother by applying the hands dexterously and cautiously to the belly.

Occasionally the pains recur very tardily, or instead of being natural, they are convulsive and opposite to our purpose. Under these circumstances we must endeavour to allay the latter, and to promote the former, if these objects are attainable. An opiate will often fulfil the former indication; and natural pains may sometimes be excited by suitable enemata,

and by friction of the abdomen. If these are insufficient, something may be administered internally to solicit rather than to stimulate nature, avoiding every thing which can agitate the woman, and excite danger.—41.

Whenever signs of putrefaction in the fœtus come on, it may be imprudent to procrastinate delivery. If the liquor amnii is discharged, the putrefactive process takes place more rapidly than if the membranes remain entire, and many unfavourable consequences arise from it. Numerous cases, indeed, are on record, in which fœtal bones have been discharged from the anus, or removed from abscesses of the abdomen, and from these circumstances it appears that decomposition of the fœtal body does not always produce acute fever in the mother. In some cases the fœtal bones have been carried in the uterus for several years.—42.

Lameness subsequent to parturition.

Puerperal women frequently complain of pain in the region of the trochanter major, and probably the obturator internus muscle, which is contiguous to the uterus on the inner surface of the pelvis, may be bruised, or injured in some other way, by the violent pains of childbirth. And in the efforts of a difficult labour, this might happen to other muscles situated within the pelvis, near the gravid uterus, especially the iliacus internus and the psoas muscles. As these muscles proceed to the trochanter minor and raise the thigh, they may occasion not only pain, like the obturator, but also a difficulty of raising the thigh, and the degree of injury, as well as the duration, will be proportionate to the severity of injury sustained. Sometimes the inconvenience does not cease—a fact which I observed in an illustrious ma-

tron whose continued lameness owed its origin to a difficult labour.

I have already adverted to the inclination of the uterus to one side—a circumstance which has been supposed to occasion lameness.—33.

Some of the causes of death subsequent to delivery.

I shall now subjoin a few remarks in relation to females after delivery.

CASE 1.

Fatal consequences from an affection of the mind ; the ligaments of the pelvis relaxed.

The woman to whom the following particulars relate, was subject to hysteria, her countenance was unhealthy, and she had borne some children. She was again in a state of pregnancy, and cherished an apprehension that parturition would prove fatal. She was particularly solicitous for a boy, and on its being imprudently mentioned to her, by the husband, that the offspring was a female, her mind was so deeply affected, that her pulse sunk, her body became cold, and within an hour and half she died. The secundines had not been removed. On the 12th of August 1707, twenty-four hours after death, I examined the body.

Dissection. From the mouth and nostrils a large quantity of fluid escaped, which had an unpleasant smell. The abdomen was as much tumefied as I recollect to have ever witnessed it in ascites, and when the cavity was opened, it was observed that this tumefaction was chiefly owing to the stomach and intestines being distended with flatus, and to the bulk of the uterus, which rose above the pelvic cavity. Some bloody serum had been effused into

the pelvis, and the vessels beneath the skin of the thighs, near the pudendum, were turgid with blood. The symphysis pubis was excessively loose, and on its being divided, some fluid escaped. Nearly the same facts were presented when we afterwards examined the junction of the ileum with the sacrum.

Lifting up the uterus a large mass of coagulated blood was discharged from the vagina. The nymphæ were nearly obliterated, which probably was owing to their extenuation during labour. The lacunæ of the external parts abounded with a whitish humour, and a considerable quantity could be pressed out of them. Lymphatics were conspicuous on the uterus, and the corpus luteum was visible in one of the ovaria. On the surface of each ovarium there was a small foramen through which a slender probe could be passed into the interior parts; and in the ovary which contained the corpus luteum, there was a roundish bony cell occupied by a bloody humour. The Fallopian tubes were longer than they generally are. The parietes of the vagina were extenuated, and the vagina itself was wider, but not shorter than natural. The os uteri was of a blackish red colour, and in some places lacerated.

The placenta had adhered to the upper part of the fundus uteri in such a way as to cover the apertures of both the tubes. It adhered to the uterus in some measure at the time of inspection, and in those places the foramina of the uterus were open; but where the placenta had been detached, these orifices were exceedingly contracted. There was no blood in the sinuses with which these orifices communicated. Both lobes of the lungs were of a whitish colour inclining to lividness. The heart was indescribably flaccid, and scarcely contained any blood.—*Morgagni*, xlviii. 44.

It cannot be denied that a considerable quantity

of blood had escaped from the uterus in consequence of the partial separation of the placenta; but I apprehend that the quantity was not so great as to have destroyed life. Instead of the vessels being almost empty, as Tabarranus found them in a woman who died of flooding within a few hours after delivery, some of them were turgid. There was not a gradual subsidence of pulse and temperature, but an instant cessation on receiving the unpleasant intelligence; and communications of that nature are always improper at such periods, but more particularly when the patient is subject to hysterical affections. The accumulation of flatus in the stomach and intestines, in this instance, preceded the hæmorrhage: in other cases they have been found co-existent.

The relaxation of the symphyses of the pelvis in the parturient woman, is not a very rare occurrence, and does not proceed from rachitis, lues venerea, or cachexy: at least, neither of these diatheses prevailed in the case before us. Nor did they exist in a matron to whom I was related, who after parturition complained of pain at the symphysis pubis, and on examination I found the bones manifestly distant from each other; at other times the bones were not disjoined. Innumerable instances of this kind are extant, and in some of them the ossa pubis were an inch apart. Santorini found that he could easily lay his thumb between these bones in some women who had recently been delivered.

Before delivery there is a gradual disposition in these junctures to relaxation. This circumstance has not only been perceptible to the finger but has been confirmed by dissection. In two women, one of whom had conceived five months, and the other seven, the cartilage between the ossa pubis was not only found thicker than usual, but was imbued with

an unctuous secretion. These appearances were most obvious in the second, in whom, even without a knife, and only by a slight effort of the hand, one of the ossa ilii was pulled away from the sacrum.—45.

In the case which has just been detailed, and in the instance of the uterus having acquired the thickness of half a span, related by Sandenius, a fatal termination speedily occurred; and in cases of sphacelation of the uterus, death soon takes place. However, puerperal women are not only liable to be carried off by diseases which are quick in their progress, but they sometimes die from protracted diseases. This has been exemplified in a case of slow fever excited by an abscess of the ovary and Fallopian tube. In consequence of laborious uterogestation, and difficult childbirth, these parts occasionally sustain essential injury.

During pregnancy, inflammation has sometimes been excited in the omentum, from the pressure of the uterus and other viscera upon it. After delivery I have found this membrane converted into an oblong and almost scirrhus tumour. The patient occasionally suffers violent pain from it, and always experiences inconvenience. There are other affections remaining after rather difficult labours, which are exceedingly troublesome though not painful. Lameness, prolapsus uteri, and incontinence of urine, have been spoken of; and tumours resembling hæmorrhoids, situated at the orifice of the vagina, are said to originate from this cause.—46.

Unnatural formations and diseases in the fœtus.

The misfortunes attendant upon childbirth do not exclusively relate to the mother; for the fœtus is not only liable to be stillborn, but it may be malform-

ed, or affected with some considerable disease. I have already alluded to some of the causes of death, and on the subject of monstrosity I prefer the detail of observations, to pursuing the controversy concerning their origin which has been agitated in the present age.—47.

CASE 1.

Acephalous fœtus.

The mother of the monstrous fœtus about to be described had borne several children, the boys being in every respect perfect, but the girls, of whom there were two, were deaf, and consequently dumb. At length she was delivered of a female fœtus, which, with the exception of the interior part of the belly, and the lower limbs, was more like a toad than a girl.

It was not quite a span in length. The body and interior parts were perfect. The neck was entirely wanting, so that the chin was contiguous to the middle of the thorax, and scarcely a digit from the cartilago ensiformis. The eyes were perfect, but the external ears were placed much lower than they usually are, and touched the upper parts of the shoulders. The mouth was gaping; the nose was imperfect at its upper part, for the root of it, and the forehead were totally deficient. Added to these horrid appearances, the abdomen protuberated like a purse, hanging downwards; and in the middle of it the umbilicus was naturally situated. The upper limbs were so united to the sternum that they could not be extended. On the posterior surface of the body the spine presented three gibbosities; the upper corresponding with the head, the middle one with the thorax, and the lower with the abdomen.

The abdominal viscera were contained in its relaxed parietes, as in a kind of sac. The head was a confused heap, having neither the usual bones of the calvaria, nor the cavity of the cranium. There were, indeed, bones of an irregular figure, some small, and others a little larger, connected together by an intricate network of muscles. No trace of the brain was discoverable, except certain bodies which, in their external aspect, finely resembled the nates and testes of the cerebrum, but their inner texture appeared intermediate between glandular and spongy substance. If the brain had not been deficient, and the girl had lived, she must have been deaf like her sisters, because both the internal auditory foramina were closed by a very firm membrane, so that the most slender nervous filament could not pass.

Although nerves were distributed through the thorax, abdomen, and limbs, as usual, no medulla spinalis was discoverable, nor any part whence the nerves originated. For in tracing even the largest nerves, as the crural, for instance, when they approached the spine, they gradually became more slender, and were fixed into it, but through the whole course of the spine not only was the medulla wanting, but there was no cavity.

. Valsalva, xlviii. 48.

CASE 2.

Acephalous fœtus ; spina bifida.

A monster which had been born two or three days before, was shown to me by a surgeon in February 1746. The mother had borne some well-formed children, but with this fœtus she had an unusually difficult labour, and ultimately the child was delivered by the feet.

Although the woman thought that she had completed the full term of utero-gestation, the foetus did not appear to be full-sized, and it was without brain. There was no neck, and scarcely any forehead. From that place, instead of its being covered with the common integuments, a reddish membrane originated. It spread over the whole upper part of the head, which was not protuberant, and it passed down the middle of the back, narrowing as it descended, till it reached near the bottom of the thorax. Beneath this posterior part of the membrane there were two bony ridges, one of which proceeded from each side of the head, and they were less elevated in proportion as they receded from it, at the same time approaching each other. They indicated a bifid spine.

At the sides of the membrane there was no deficiency of common integuments, which were furnished with hair on both sides of the head; and the ears were contiguous to the shoulders.

There was a large quantity of fat beneath the skin, and the thoracic and abdominal viscera were natural.

Beneath the red membrane upon the head there was nothing like brain, except an appearance in the form of two little horns. These bodies were thick, soft, and of a red colour, one on each side of the cranium, resting on the posterior roof of the orbit. When cut into, they appeared to contain a kind of mucous matter, as well as coagulated blood. The anterior roof of the orbit, the bones of the sinciput, and the posterior part of the os occipitis, were wanting.

The temporal bones were extended downwards and backwards, and at the foramina of these bones which the auditory nerves enter, I sought in vain for the beginning of these nerves, as I did for the

others usually found in the basis craniî. Consequently I was less surprised, when, on examining the eyes, I found the optic nerves more slender than usual, and apparently terminating within the orbits. The eyes, it may be observed, as well as the eyebrows, were well formed.

The tongue was long and narrow, corresponding with an elongation of the lower jaw.

Three of the cervical vertebræ were deficient, and the remainder were so crowded upon each other that parts of some of them were united into one substance with contiguous parts of others. Similar consolidation had taken place between the bodies of two or three of the upper vertebræ of the thorax. From this part the spine curved towards the left side, and afterwards towards the opposite.

On the right side there were only eleven ribs, but on the left there were twelve. With respect to vertebræ, there were eleven dorsal and six lumbar.

The circumstance, however, most worthy of notice was, that the spine was really bifid. With the exception of the lower lumbar, the bony matter which, added to the bodies of the vertebræ, forms the tube, was collected on both sides and expanded: consequently there was no tube and no spinal marrow.—*Morgagni*, xlviii. 50.

In the the same year, 1746, Philip Baroni sent me the following observation.

CASE 3.

Acephalous fœtus; spina bifida.

A monstrous girl was brought forth in the beginning of the sixth month after conception. The mother was thirty six years of age; her complexion was unhealthy and she was greatly emaciated in consequence of over-exertion and unwholesome diet.

Beyond the eyebrows there was neither forehead nor head; the nose was depressed; the mouth gaping; the outer ears were contiguous to the shoulders, and the right very much inclined downwards. There was neither neck nor chin, for the face, below the ears and mouth, terminated immediately in the chest.

The greater part of the abdomen was not invested with the abdominal muscles and common integuments, but with a loose membrane extending in the form of a very large purse. The muscles and integuments, gradually extenuated, at length appeared to degenerate into this membrane; and being pellucid from its thinness, the liver and intestines were seen hanging outwards.

The right thumb was wanting. The dorsal region was covered with hairs, and at its upper part, midway between the scapulæ, there was a large and deep fissure, gaping like a mouth. It was formed by a defect in the vertebræ at that part. From the occiput, a little above this rima, a kind of flat muscle arose. Its basis was broad, and being unconnected with other parts, it partially covered the eyes and nose when it was extended forwards; and, if carried to the posterior parts, it covered the back quite to the loins. In figure and magnitude it was similar to the tongue of a male adult.—*Morgagni*, xlviii. 52.

In 1735 I had an opportunity of seeing a monstrous fœtus at Padua; and the following is a description of its peculiarities so far as they were observable without dissection.

CASE 4.

A matron, forty-one years of age, enjoying pretty good health, and the mother of several well-formed children, produced a monstrous infant. Many of the

symptoms attendant upon former pregnancies were absent, and she did not perceive the motions of the foetus. In the latter months a hard and circumscribed tumour, like a distended oblong bladder, was generally perceptible in the hypogastrium, but it soon vanished. Labour, at length, came on, and the foetus and secundines were expelled together, with unusual facility.

The placenta appeared small; the amnion contained a yellowish and turbid water, and the dead infant appeared as long as those generally are which are expelled between the fifth and sixth months. Its face was very long, and from the middle of the lower part of the forehead a fleshy globe projected. Beneath this mass the eyes were situated, and, as the nose was wanting, they were contiguous to each other. They were not covered with eyelids, but with a transparent membrane. The mouth was in its proper place, but gaped so as to show the incisor teeth. The abdomen was open in the middle, and the intestines protruded. The common integuments were also open at the loins. Both the upper and lower limbs were distorted.—*Morgagni*, xlviii. 53.

This woman had never experienced any mental impression to which the deformity of her offspring could be ascribed. Though there are some cases in which it appears scarcely possible to avoid admitting the influence of imagination, which influence has been allowed to exist by the most distinguished men, yet I am not disposed to attribute every monstrous foetus to this source.

In the foetus just described the protrusion of the intestines from the abdomen must be ascribed to the circumstance that this part had never been sufficiently closed; for Harvey saw the same part open in embryos of animals denominated perfect; and I have noticed the same fact in those of dogs.

When it is merely closed by the peritoneum, the peristaltic motion of the intestines is visible through it, as has been asserted by Ruysch, who has three observations relating to imperfections of this kind.

The preceding examples of monstrosity relate to a deficiency of parts; but I shall subjoin others in which there was a redundance of some parts, with a deficiency of others, or in which the superfluity existed independently of any such defect.

Double fœtus.

Trombelli formerly sent me the account of an instance of twins united. They were not only conjoined externally, but there was the deficiency in the abdominal parietes just adverted to, and their inner structures were intermixed. The case has been published by Vallisneri in his elaborate volume on generation.—54.

The following specimen of redundant structure was observed by Mediavia.

CASE 5.

Double liver.

An infant was born at Padua about the beginning of July, 1736. On the right side, and a little above the navel, there was a tumour the size of a man's fist. It was devoid of skin, for, being elevated in the circumference, it terminated in a kind of prominent border. The tumour was unequal, and yielded to the touch, so that it appeared to consist of the intestines. At first the child neither sucked nor voided excrement, but soon afterwards it effected both. A degree of lividness had been perceived in the tumour, and, at length, it became completely gangrenous. Part of the recti muscles sloughed

away with the surface of the tumour, and the infant died on the thirty-fifth day after its birth.

Dissection. The liver was double. One liver occupied the usual situation, and, though rather small, was divided into very long lobes. The other was larger but shapeless; and was joined to the former by a thick membrane. It was annexed to the trunk of the vena portæ, but its veins proceeded below the other liver into the vena cava. It extended to such a degree as to force out the peritoneum, which adhered to it; and constituted the protuberance of which I have spoken. However, although the liver was double, there was no appearance of a gall-bladder. The small intestines were in a natural state, but the colon was contracted.—*Morgagni*, xlviii. 55.

In March 1745 a two-headed calf was sent to me from the mountains, but on account of the distance, and with a view to preserve it, most of the abdominal viscera had been removed. The heads and necks, as well as the body, appeared perfectly natural. The spines, as they proceeded from the necks, continued distinct in the thorax, but they gradually approximated, and, below the thorax, were conjoined. The transverse processes occupied the intervals of the spines, and became shorter in the order of their approximation, and corresponded with the ribs in thickness, breadth, and situation. In the same interval passed the descending trunk of the aorta, which was very large, in consequence of two being united. As far as the interval continued the aorta gave off three intercostal arteries instead of two; and one of them was distributed to the interspace itself. Both tracheæ were divided into double bronchia, and each cavity of the chest contained two lungs of a large size. There were two thymus glands. A single pericardium contained two hearts, quite disjointed

from each other. That surface of the left which was contiguous to the right was excavated to receive the natural convexity of the other. The right presented its usual surface to the spine, but that surface of the left which is usually turned to the spine presented to the other heart, and was concave, as I have just stated.—57.

Fissured palate.

Infants are sometimes born without a palate, or having a fissure in the palate, in consequence of which the mouth is less appropriate for sucking. Maloet relates that a child born without a palate lived fifteen days by putting milk into its mouth with a spoon; and Petit mentions instances of children born with a fissured palate being preserved by sucking the teat of a goat, giving them the dug when half full of milk. The teat, under these circumstances, closed the fissure of the palate. This method was adopted for those who could not have accustomed themselves to the inconveniences in sucking and swallowing, which are the necessary consequence of a fissured palate. With the hope of accustoming the child to bear these inconveniences, or, at least, of preserving it longer, on one occasion I caused nutritive clysters to be administered.—60.

Jaundice.

This disease is manifest to the eye, but the cause is uncertain. Almost all children are slightly jaundiced a little after birth, but occasionally the newborn infant is very considerably affected with this disease. If the cause of the slight icteric affection were ascertained, I think there would generally be

some means of conjecturing the cause of the more violent.

Fifteen children of my own became yellow soon after their birth, and some of them in a considerable degree. The disease was spontaneously carried off in all them.

If we must assign a common cause for this occurrence, it is probable that our attention should be directed to the umbilical vein. In consequence of its being divided or tied, some contraction in the vena portæ, into which it is continued, may result; or on account of its being deprived of the blood which returns from the placenta, the secretion of bile in the liver may be retarded till this viscus becomes gradually accustomed to its new mode of action, and is adapted to the separation of bile. This opinion, however, rests upon conjecture, but there remain other sources of disease which may be confirmed by dissection.—60.

Premature obliteration of the ductus arteriosus and foramen ovale; and also, their remaining open.

Among the remarks made by Cowper in his appendix to the anatomy of the human body, I recollect to have read that many of the individuals in whom he found the ductus arteriosus and the foramen ovale closed too soon, had suffered numerous diseases, such as inflammation of the head, of the parts in the neck, and of the lungs. Therefore when new-born infants are attacked with these affections, without any manifest cause having preceded, there will be no absurdity in suspecting this premature occlusion.

The reverse of this preternatural structure, namely, the passages in question, never wholly closing, not unfrequently occurs. Others, as well as

myself, have often found the foramen ovale open, and sometimes the diameter of the opening has not even decreased. We may infer that the same thing happens to the ductus arteriosus also.

If some bodies sustain these defects without manifest suffering, it is probable that there are many more which cannot.—61.

Valve of the foramen ovale wanting.

In the body of an infant which died when not more than fifteen days old, but of what disease was unknown, the following appearances were observed.

Dissection. The heart and vessels about it were surprisingly distended with blood. Those parts of the umbilical vessels which are within the abdomen, and the ductus arteriosus were open; and the foramen ovale was not merely open, but entirely without its valve, so that not the smallest trace of it was discoverable on the most attentive examination.

Morgagni, xlvi. 62.

This case was communicated to me by Jano Planci, and the appearance was totally preternatural. It is evident that when the part is wanting which the blood urges on the left side, so as either to close the orifice, or to cover it partially; the motion of the blood which is required in breathing animals, must be disordered in the principal organ. If this perversion is not diminished, the action of the heart, as well as the motion of the blood, must, at length, be impeded.—63.

A wide and almost unbeaten track lies open, to investigate the diseases of new-born infants by accurate dissections after death, as well as by attentive observations during life.

A degree of caution is necessary in recording

these appearances, for some which are natural, have been related as the fatal disease. This observation applies to the close adhesion of the dura mater to the cranium. However, if the advantages resulting from a diligent study of anatomy were confined to the discrimination of natural and preternatural structure, in the investigation of the causes of disease, certainly it ought to be held in high estimation.

The bodies of young infants have many peculiarities besides those which I have noticed, and whoever desires to investigate their obscure diseases, to detect those appearances which are really morbid, and compare them with the symptoms, ought to habituate himself to the dissection of their bodies. This is requisite to enable him to remove or alleviate their diseases; and, where this is impracticable, at least, it will assist him in the prognosis.*

* In the fifth volume of the *Medico-Chirurgical Transactions*, Mr. Lawrence has written a paper on monstrous productions which, at least, is valuable in the facts which it concentrates. "The imperfect organizations of a more striking kind," he says, "most of which come under the notion commonly affixed to the term monster, may be arranged under the four divisions of 1, unnatural formations; or 2, unusual position of certain organs; or 3, of deficiency; or 4, redundance of certain parts. The kinds of monstrosity are not kept distinct in each case: they may all be united in one specimen, and the want of one part is often attended with unnatural position of another," &c.

He introduces this article by relating the particulars of an acephalous foetus which lived from Sunday till the following Thursday, and a little nourishment was given to it by the hand. It voided urine twice in the first day, and once a day afterwards, and it had three dark-coloured evacuations. The medulla spinalis was continued for about an inch above the foramen magnum, swelling out into a small bulb, which formed a soft tumour on the basis of the skull. All the nerves from the fifth to the ninth were connected to this tumour. This acephalous monster was a female, and the cases which presented themselves to Sæmmering, as well as Morgagni, were mostly of that sex. I have one instance of it in my own possession. In the first two cases related in the text, Morgagni has expressly said that there was

In the writings of Wepfer there is an example of a fatal symptom upon which a prediction was founded which accorded with anatomy, and the fact has been witnessed by myself. When the death of infants is at hand, I have not only seen deep sulci about the lambdoidal and sagittal sutures, but also a small indentation near the junction of the coronary and sagittal sutures. This arises from the brain having collapsed, and, in consequence of its connexions with the dura mater, by subsiding it draws inwards whatever of a membranous nature remains in the interstices of the sutures, and consequently produces the furrows and the pit which have been mentioned.—64.

a total deficiency of medulla spinalis, as well as of brain: yet there was the natural distribution of nerves; and, indeed, other parts of the body were well formed.

Morgagni's observations on fissured palate may lead to a supposition that the act of sucking is attended with extraordinary difficulty. In the examples of this deficiency which have occurred to me, there was probably a little inconvenience at first, but the infant very soon learned to suck with the utmost facility.

Morgagni implies that imagination or some powerful action of the mind, may sometimes be the cause of these deviations from nature. The mind of the parent certainly may affect the vitality of the foetus, but I see no foundation whatever for supposing that its configuration admits of being modified through the same agency. It frequently happens that the mind has undergone very strong emotion, and, in consequence of the vulgar prepossession, the mother expects a malformed offspring; but I never knew, or heard of a well-authenticated instance in which the expected deviation occurred. On the contrary, it usually happens when the mother is perfectly unconscious of any unfavourable impression, till some naevus upon the infant's skin, or something defective or redundant in other parts, leads her to suppose that some powerful emotion in her own mind must have occasioned it. Perhaps, however, one of the strongest arguments against mental influence is derived from the fact that quadrupeds and birds are liable to all these malformations, malpositions, defects, and superfluities.—*Ed.*

CHAPTER V.

FEVER, TUMOURS, DISEASES AND INJURIES OF BONES AND JOINTS, STRANGULATION, AND POISONING.*

SECTION I.

FEVER.

OF all diseases fever is the most frequent, and presents itself under the greatest diversity of form. Much has already been said on this subject when treating on other diseases, consequently but little remains to be adduced. In most of the cases selected from the papers of Valsalva, it may excite surprise, that, after violent febrile affections, or those which are destructive to life unexpectedly soon, scarcely any morbid appearance is discoverable which bears a proportion to their violence, and sometimes there has been no apparent lesion.

Morgagni, Epist. xlix. Art. 1.

In the body of a man who had been affected with febris lenta there was a calculus in the gall-bladder, the lungs were variegated with black spots, the blood in the dead body was extremely grumous, but in the ventricles of the heart it was coagulated.

Valsalva, xlix. 2.

* Although the subjects included in this chapter have no greater affinity to each other, than to any of the preceding chapters, yet, being residuary articles, I thought it better to associate them than to multiply divisions.—*Ed.*

A boy died emaciated. There was adhesion between the pericardium and heart; and the lymph effused presented a granulated appearance.

Valsalva, xlix. 4.

A woman, about thirty years of age, who had long been affected with double tertian fever, received a blow on the abdomen with a stick. She was admitted into the hospital, and only complained of pain in the abdomen. On the third day she became delirious, the disease daily increased, and at length she died.

Dissection. The liver was pale and indurated, and the gall-bladder contained about three ounces of black bile. The posterior part of the lungs presented a very red appearance.—*Valsalva*, xlix. 6.

In the fourth case there was no morbid appearance which accounted for the fever; and in the fifth, the febrile symptoms arose from peripneumony.—8. 10.

A man, forty years of age, while recovering from a wound on the tibia, was seized with acute fever, which increasing in violence, he died. No morbid appearance was observed, except that the blood retained its natural fluidity.—*Valsalva*, xlix. 12.

A nobleman, about forty years of age, subject to constipation of the bowels, was seized with fever, which was attended with no other symptoms than continual anxiety of mind and watchfulness. In the course of the fourteenth day headach came on, and he died.

Dissection. The fundus of the stomach was tinged with a black colour; the intestines, especially the colon, were contracted; and the blood was greatly coagulated.—*Valsalva*, xlix. 14.

To these cases Morgagni has subjoined instances which fell beneath his own observation, or under the notice of his friends.

CASE 8.

Hectic fever, from disease in the brain and spinal marrow.

A man became greatly emaciated, and on that account many persons supposed that he was affected with phthisis. At length he was admitted into this hospital, and died in March 1747.

Dissection. The abdominal and thoracic viscera were in a healthy state. The dura mater was thickened, and the cerebrum was exceedingly flaccid. When about to demonstrate the spinal marrow I observed that the dura mater, in this part, could not be drawn off so easily as at other times. In separating it from the tunica arachnoides I was under the necessity of proceeding cautiously, to avoid laceration. The skin on this body was exceedingly hard, as it generally is in turbid subjects.

Morgagni, xlix. 16.

The firmness of the cutis mentioned in the preceding case is very evident when tried with a knife or needle, not only in phthisical persons, but in others who have been greatly emaciated.—17.

CASE 9.

Hectic fever from organic lesions.

The body of an old man whose extreme emaciation was attributed to senile marasmus, was brought into the college in January 1741.

Dissection. The mesenteric glands were not so minute as they generally are at the advanced age of this individual, and the iliac vessels, from their origin to the thigh, were surrounded by a chain of enlarged glands. Some of these glands were two or three digits long, and proportionably thick; but when cut

into they did not appear to deviate from the natural texture of lymphatic glands. The membranes of the spleen were thickened, and, for an extent of two digits, they were indurated and partially osseous. The origin of the splenic artery was somewhat contracted. The bladder was so distended with urine as to rise above the pubis; its coats were thickened, and, when compressed with the hand, the urine was expelled with difficulty,—indeed, the whole could not be forced out, and the impediment appeared to consist of an enlargement of the prostate gland, and its projecting into the bladder. The heart was destitute of fat, pale coloured, and not smooth on its surface. The valves of the aorta were indurated, and the vessel itself had bony laminæ beneath its inner coat, at a small distance from the valves. But through its whole course it was beset with opaque spots, and they were continued through the iliac branches. When the carotid arteries had ascended one half their length, they were contorted like a cochlea, and then immediately regained their former straight course.—*Morgagni*, xlix. 13.

There is no cause of emaciation more frequent than obstruction in the mesenteric glands. This obstruction may arise from the primary or ultimate glands of the mesentery being alone affected, or they may be diseased promiscuously. An example of the first kind is given by Fantonus, and the man in whom it occurred had been confined during several months under hectic fever. After death Fantonus found chyle only in what he describes as the *vasa lactea primi generis*; it being obstructed in its farther progress by the glands which these vessels enter. Cowper met with an example of the second description in a lean heifer, in which two enlarged glands compressed the receptaculum chyli. Examples of the third species, derived from bodies which

had been affected with atrophy and hectic fever are common.

Fabricius has recorded the dissection of a woman in whom the mesenteric glands had disappeared, and she was reported to have died of marasmus. In old people these glands decrease in size, and probably some impediment to the transmission of chyle may result from this cause.—19.

There are some species of fever in which it is desirable that a degree of collapse should happen. In the case of a young woman labouring under acute fever, perspiration came on, and the acuteness of the symptoms subsided, but the fever continued upwards of a hundred days. The fulness of her face continued, and she was never pailid: therefore, when the fever appeared to have ceased, and she had risen from bed, it again discovered itself, as had been expected. At length, the febrile symptoms and the plenitude of the body disappeared together. However, it must be admitted that there are numerous instances of fever in which perspiration, and other evacuations, have proved critical.—20.

Epidemic fevers exist under so great a variety of circumstances that a skilful physician will not adhere pertinaciously to any predetermined opinion, but will observe attentively, and not infer from a single observation, or an accidental recovery, the treatment which ought to be pursued in other cases. I saw a woman who laboured under continued fever, and after blood had been withdrawn from the arm, the symptoms immediately became more violent. The blood contained but little serum; and the accession of symptoms proved to be a paroxysm of ague. From being continued fever, it assumed the intermittent type, and soon disappeared. This conversion, however, was fortuitous, and

not attributable to the loss of blood. Such cases often occur in practice.

The prevailing opinion that an eruption round the mouth indicates a crisis in fever, is not so unequivocal as the deposition of red particles from the urine; and occasionally there is an appearance of similar particles floating on the surface of the urine at the same time. It sometimes happens, though very rarely, that these particles are whitish. They presented this appearance in a young man in whom malignant fever, accompanied with petechiæ, began to decline.—21.

The individual alluded to had been bled by venesection and cupping four times. The blood was unnaturally fluid, and its crassamentum softer than usual; and after the third bleeding the serum was of a white colour.

In the following month another young man was affected with fever which tended to the malignant form, and the blood abstracted on the third and fifth days exhibited a whitish serum. In the blood first drawn there were only a few drops of serum, and the crassamentum was hard, and covered with a moderately thick crust; but on the fifth day, the coagulum was softer than natural, and covered with a crust as thick as the crassamentum itself. It was not hard, but so tough that it could scarcely be cut with a knife. In those malignant fevers in which sandy particles appeared, I neither observed a whitish serum nor a very soft crassamentum; but the latter was sometimes more dense than usual: and in one person, in whom, at other times, it was of a soft consistence, the coagulum was firm.

Morgagni, xlix. 22.

The following case, for which I am indebted to Mediavia, tends to show that a great quantity of blood is sometimes united with malignancy, and augments the violence of the symptoms.—23.

CASE 10.

A woman, fifty years of age, having been very evidently attacked with malignant fever, was brought into the hospital. During the first six days the pulse was small and obscure, though it afterwards became more developed. Urgent dyspnœa and palpitation of the heart coming on, she died within two days. No part was opened except the thorax.

Dissection. The left ventricle of the heart contained half-coagulated blood; and not only was there such an accumulation of blood in the right ventricle as to distend the cavity, but it formed a dense concretion, and resisted the knife as much as the most tenacious crust of blood drawn from pleuritic patients.—*Morgagni*, xlix. 24.

It has been supposed that some acids taken into the stomach have a tendency to promote coagulation of the blood.

I shall subjoin a few observations which were attentively made upon the blood drawn by venesection. On other occasions I have met with blood which exhaled a nauseous acid odour, but though I have bled in several malignant diseases, I never observed an acid odour arising from that blood. I distinguished it, indeed, in a woman who laboured under continued fever, and also in a man and boy who were affected with mild tertian fever. Though I perceived this odour in the blood drawn from the man, four hours after its abstraction, yet at the expiration of seven hours it could scarcely be detected, which showed that the acidity existed in particles more volatile than those which occasioned it in the blood of other persons, in which the odour was powerful at the expiration of twelve hours. I have observed the same odour where there has been no

fever, for instance, in a case of periodical headach, and in an instance of scabies. In other cases of the latter disease the acidity did not exist.

Morgagni, xlix. 25.

In the following case which occurred at Padua ten years ago, the blood was said to be cold.

CASE 11.

Catharine B., a married woman of a sanguineous temperament, who menstruated regularly even when suckling, laboured under inflammatory fever in the spring and autumn of twelve successive years, and on this account she was often bled. In her twenty-ninth year, at the time of menstruation, she received the unexpected intelligence of a fatal accident having befallen her brother. At the moment of receiving this information she fainted, and on recovering, she perceived that the catamenial flux had been checked. However, on the following day there was a discharge of a coloured fluid, which occasionally recurred for some months.

In the spring of ten successive years she had an attack of double tertian, and these accessions were carried off by repeated bleedings and the administration of peruvian bark; and after the lapse of these ten years she was seized with febrile affections nearly of the same description, but accompanied with violent pain of the abdomen. With other measures to subdue these symptoms she was bled six times. The serum of the blood was of a saffron colour, and the crassamentum was hard and incrustrated; but though the fever and other symptoms were mitigated, they were not removed till uterine hæmorrhage supervened on the fortieth day of the febrile attack, from which period she speedily recovered. She menstruated naturally for twenty months, and enjoyed extremely good health. After that time, namely

in the autumn of 1749, owing to fatigue of body and anxiety of mind, she was affected with nausea, watchfulness, head-ach, and lassitude. In the succeeding winter, the following symptoms were added to those just mentioned. The upper parts of the body felt hot while the inferior parts were cold. She experienced occasional horripilatio; she was suddenly roused in the night under a sensation of alarm accompanied with tremour; and she became subject to vertigo. In the year 1750, when she was in her forty-third year, the menses which had always been copious, and often extremely hot, began to diminish, and at length the discharge was perfectly cold. Mediavia was consulted at this period, and after opening the bowels, he directed blood-letting, and the circumstance for which this case is detailed then manifested itself. She said that the blood felt like ice sliding down her arm, and the surgeon's hand was sensibly affected by the coldness. The serum was small in quantity and of a yellow colour; the crassamentum was black and viscid. Blood withdrawn from the foot in the evening had the same coldness as that which had previously been abstracted.

Morgagni, xlix. 26.

In 1758, some years after the period included within the preceding report, and when this woman had attained her fifty-first year, menstruation ceased. She enjoyed good health, except that she experienced a constant sensation of icy coldness in the abdomen, and, sometimes, when this sensation ascended to the thorax, it induced such difficulty of respiration that the abstraction of a considerable quantity of blood was necessary.—27.

By other persons the blood has been observed cold.—28.

Fever sometimes exists without being accompanied with an augmentation of temperature. When

I resided at Bologna a man was seized every day with chilliness, and though it was not followed by any elevation of temperature, it was considered as a febrile attack.

A woman, fifty years of age, was received into the hospital of St. Mary de Morte, and, at a particular hour every night, she was seized with rigour, trembling, and obscurity of pulsation; and these symptoms continued through the night without being followed by any febrile heat. At other times she had transient attacks of a similar nature. The disease had existed for twenty days when peruvian bark was resorted to, and by this medicine the disease was cured.—*Morgagni*, xlix. 29.

It occasionally happens that the paroxysms of intermittent fevers are accompanied by the most alarming symptoms. This was demonstrated in a patient of rank to whom Vallisneri and myself were called. He was affected with a most dangerous tertian fever, and we saw him during the second accession. He was incapable of speaking, and was totally insensible. He had stertor, and very difficult respiration, and was entirely like a person in apoplexy except that there was subsultus tendinum; and the pulse was very indistinct and unresisting. Our hopes of his restoration rested exclusively upon the circumstance of his having recovered from a similar attack three days before. At the commencement of the night his pulse became less unfavourable, the skin became moist, and before morning all the dangerous symptoms had disappeared. As soon as the remission commenced I gave him half an ounce of bark, and afterwards an ounce and a half, divided into much smaller quantities, and distributed into proper intervals. By this means the return of the paroxysms was prevented.—30.

Although these comatose symptoms usually come

on in the early paroxysms, this is not uniformly the case. Among the indications of their approach may be observed stammering, or mutilation of words, or one substituted for another, as sometimes occurs when a slight apoplectic affection is about to degenerate into paralysis of the tongue.

During an exacerbation of fever, in addition to the symptoms which have been mentioned, the mouth has been evidently distorted, and in succeeding paroxysms this affection has increased, so as to terminate in apoplexy and paralysis of the side. Whenever such symptoms occur, during intermittent fever, bark must be administered in the remission, as in other cases.—31.

I have not so many observations to communicate on this subject as on others, because there is some hazard in dissecting persons who die from fever. This, indeed, has been disputed by authors, but it is unquestionable that fatal consequences have resulted. In this theatre, a young man, of a robust habit, had partly dissected the body of a man who died of petechial fever, and he was seized with the same affection, and died. In 1717 Vulpus opened the body of a woman who died of apoplexy, which came on during the progress of malignant fever, and I stood by to demonstrate the situation of the viscera to the auditors. The body was quite cold, and though, when the abdomen was opened, no very unpleasant odour ascended, nor was there any disease except an entangled state of the intestines, yet I immediately felt an unusual degree of languor, bordering upon syncope; and we had scarcely returned home when both of us were seized with febrile shuddering and chilliness, succeeded by a hot skin*.

Morgagni, xlix. 32.

* The reason assigned by Morgagni accounts for his pathology

SECTION II.

TUMOURS.

Many instances of tumour presented themselves to Valsalva, some of which he did not record, and

of fever not being very satisfactory. Perhaps, indeed, there is no disease in which the deviations from healthy structure are less uniform than in fever. Though morbid appearances might, in general, be discovered by examination after death, yet it is often difficult to say whether they were the cause or the consequence of the febrile affection. Generally there is some determination of blood to the head, but though resembling inflammation, it does not exhibit the usual characters of phrenitis. However, inflammation has been found in the brain or viscera in these cases, and has terminated in abscess and gangrene. That excellent anatomist, Dr. Macartney, states as the result of his anatomical examinations of persons who died of typhus fever, that the morbid appearances are not those of common visceral inflammation. According as the head, lungs, or abdominal viscera, were engaged in the disease he met with,

1st. Fulness or distention of the vessels of the brain, especially of the veins; and some water was effused on the surface, and into the cavities of this organ.

2ndly. The same species of congestion in the lungs, and different degrees of effusion into the cavities of the pleura and pericardium.

3rdly. Venous congestion in the liver, spleen, or alimentary canal; sometimes a bloodshot appearance or spots of extravasation in the mucous coat, more particularly in the stomach and first coils of the intestines. In some instances a more generally pulpy, or swollen, and discoloured state of the mucous coat of the alimentary canal. These congestions were always of a purple or venous colour, and the blood throughout the body appeared to be accumulated in the venous system, and had little tendency to coagulate.

The mucous coat of the intestines often becomes inflamed in fever, and not unfrequently ulcerates. I have met with these appearances in several cases, and in one instance of typhus fever, from which the patient had nearly recovered, symptoms of enteritis unexpectedly came on, and the patient

others have either been published by himself or related by me in preceding articles.

CASE 1.

Carcinomatous tumour of the mamma.

A maiden, fifty years of age, of a lively disposition, and in whom menstruation had ceased for some years, had a cancerous tumour of the right side, near the armpit. It increased greatly in breadth and length, and ultimately reached the axilla; and the contiguous limb became œdematous. To this affection cough was added, and was accompanied with mucous expectoration, difficulty of breathing, and urgent thirst. At length she died.

Dissection. The tumour had not apparently injured the parts upon which it was situated, to any great depth. On cutting into the neighbouring arm, a large quantity of serum issued from the cells of the adipose membrane.

died within a very short time. On examination I found the mucous coat of the intestines ulcerated, and, in one part, the parietes were perforated, and the contents of these viscera were effused into the abdominal cavity. It appeared that the acute symptoms came on when the peritoneal coat gave way. In the exanthemata, especially in scarlet fever, I believe the mucous surface of the alimentary canal often is greatly diseased. This has recently been manifested in a severe case of scarlatina anginosa in one of my own children. The throat, mouth, and nose were extensively ulcerated, and the tumid and tender state of the abdomen, indicated that inflammatory action pervaded the intestines. Soon after convalescence began, and sloughs were thrown off from the mouth, the stools presented a very bloody appearance, and were loaded with flakes of dark coloured substance somewhat like the incrustations which had lined the cheeks, gums, and palate, and been removed.

It very rarely happens that there are not strong evidences of topical disease in fever, but I have recently attended a most severe and protracted case of synochus in which I was never able to detect any local affection.—*Ed.*

The corresponding cavity of the thorax was filled with serum in which numerous concretions floated. The lung there was so compressed, that, at first sight, it appeared to be wanting; and the heart was extremely small.

The fundus of the stomach was greatly extended, the spleen was very small, the liver inclined to a brown colour, and the gall-bladder was slender and empty. The ovaria were white and indurated.

Valsalva, l. 4.

The tumefaction of the arm arose from compression of the axillary vein. Other instances might be adduced in which an external cancerous tumour has been attended with a difficulty of breathing, and hydrothorax.—5.

The following observation tends to elucidate some of the circumstances attendant upon scirrhus degenerating into carcinomatous ulceration, and to exhibit its consequences. The patient was of a melancholic temperament, which is always unfriendly to the removal of these diseases.—*Morgagni*, l. 47.

CASE 2.

A country woman, fifty years of age, received a blow upon her left breast. A month afterwards a tumour discovered itself, and an effort was made to counteract its increase by compression with a concave plate of lead. By the seventh month after receiving the blow, however, it had so enlarged as to extend from the upper part of the breast—where it was thicker, harder, and of a more irregular figure—to below the areola, which was nearly concealed among the transverse rugæ. When the humerus was lifted up there was some pain in the axilla, and the whole of the adjacent limb was œdematous. These circumstances, combined with the

adust and melancholic disposition of the woman, were considered unfavourable to the removal of the tumour; but her robust strength of body, her intrepidity of mind, and her extreme sufferings, led to its extirpation; and, till the seventh day, the operation seemed to have been successful. At this time inflammation and sloughing came on, and destroyed all the remaining cellular texture of the breast, and also that part of the pectoral muscle situated beneath the breast, as well as the external and internal intercostal muscles: so that the costal pleura was denuded to an extent of five digits. The cartilage of the fourth rib became black, and was nearly disjoined from the sternum: the ulcer discharged an offensive ichorous pus; the œdema of the adjacent limb increased, and the limb itself became motionless and nearly insensible. The legs became tumid; the frequency of the pulse, the thirst, and watchfulness increased. To these symptoms were added diarrhœa, impaired appetite, decay of strength, difficult and frequent respiration, and continued somnolency. The symptoms last mentioned were succeeded by four protracted febrile paroxysms, which were extremely violent in degree, and conjoined with rigors. They recurred after an interval of about ten hours, and ultimately the woman was carried off by them.

Dissection. The corpse was generally flaccid, and there was no œdema of the limbs. The spleen was slightly enlarged, black, and flabby; and the uterus was extremely hard. Both cavities of the thorax contained a large quantity of fluid, particularly the left. The lung corresponding with the ulcer was dry and almost scirrhus, and adhered closely to the pleura at that part; and this membrane was united much more firmly to the ribs than is natural, and where it was exposed to the atmos-

phere, it had become callous. The axillary glands were converted into a scirrhus mass, of great firmness and of a livid colour; and the cellular membrane investing it, was changed into a kind of steatoma.

The circumstance of these tumours having compressed the vessels and nerves, elucidated the cause of the partial paralysis, and the obstinate œdema.

Morgagni, l. 48.

I have seen numerous instances of tumours on the penis, and anus, as well as on the female genital organs, but have not had an opportunity of dissecting them. I was present when Valsalva amputated a cancerous tumour which occupied the glans and a large portion of the penis. He apprehended that the penis or the arteries might retract, but neither of these circumstances happened, and he secured the vessels by ligature.—l. 50.

Cases have occurred in which almost all the globate glands of the body have been scirrhus. This was observed by Zinnius in the body of an infant, and some parts of the cerebrum were indurated also.—lxviii. 13.

The following is an example of tumour which almost resembled cancer, but was not of that nature.

CASE 3.

Tumour of the breast containing bone.

Tubercles formed in one of the breasts of a nun at Padua. At first they were at a distance from each other, but, at length, they coalesced, and exhibited such inequality of surface, and were so painful, as to be considered of a cancerous nature. A tumour the size of a walnut was extirpated, after having existed for thirty years, and was found to

consist of many little pieces of bone of various sizes, and not disposed in any regular order. Betwixt the pieces was interposed a substance almost like ligament, and when dried it assumed a black colour; but the bony fragments were white. The breast healed.—*Morgagni*, l. 41.

I supposed that this body originated from the coats of the lactiferous ducts, the blood-vessels, or some other membranous structure, having become ossified.—42.

The Sepulchretum contains an example of the breast having become universally bony.

Mammary tumours are not confined to the female, but sometimes they arise on the male breast also; and, in their incipient state, nothing has been found of so much service as keeping the arm in a quiescent state for a long time.—44.

Gouty concretions in the breast.

On the upper part of the right mamilla of a gentleman, a substance like a small gland projected. Within twelve months it had enlarged to the size of a fist, and was very hard; and two months afterwards it burst. The integuments and fleshy fibres appeared to have constituted a kind of shell which contained matter in some places resembling a calcareous concretion, but in other parts the concretion was of a softer texture.

The father and grandfather of this patient had been subject to gout, but the patient himself had never observed any other symptom of it than a transient pain in the great toe. His other physicians coincided with me in the opinion that the gouty matter, which in the ancestors of this patient had been deposited by glands in the joints, had been secreted by the mammary gland.

In proportion as this matter was removed, it again formed till the whole tumour was extirpated.—46.

CASE 4.

Tumour of the breast removed by compressing its blood-vessels.

An aged country woman, exceedingly squalid and emaciated, lay in the hospital of incurables at Bologna. The cause of all her complaints was a tumour of the right breast, and in form and magnitude it resembled the human brain. It was universally ulcerated; and in several places, amid its red and bloody substance, it exhibited numerous bodies like glands, white, oblong, and smooth, and equal in size to the largest grapes. Owing to the debilitated condition of the woman, Valsalva did not think any method of removal could be attempted except by first compressing the base of the tumour by means of a bandage. The bandage was applied, and its tightness increased every day, so that the supply of nutriment being intercepted, the edges of the tumour soon began to slough, and the base daily lessened. This plan was persevered in for a considerable time, and the tumour, reduced to a very small size, was, at length, safely extirpated. The wound cicatrized, and the woman was dismissed greatly improved in health. A year or two afterwards she presented herself again, looking extremely well for her age, but a very small tumour had arisen beneath the skin of the breast, and, as the large one commenced in the same way, she requested its removal. Valsalva complied with her wishes, but he expressed an apprehension that fresh tumours would appear in other parts, and that they would be very likely to form in the uterus.—l. 16.

Temporary reputation has been gained by various methods of removing cancer, but ultimate success has not corresponded with the fame of the practitioner; and when the prolongation of life, and the entreaties of the patient, demand the removal of the disease, excision is to be preferred. It happens but rarely, however, that the extirpation of cancer is, in every respect, successful; for although the wound may cicatrize the disease usually returns in the same part, or in some other.

CASE 5.

Valsalva informed me that a maiden had a small protuberance on the ankle, and for more than sixteen years it occasioned most violent pain. Making an incision into the part, he found a body like a small gland, of a texture apparently intermediate between conglobate and conglomerate glands. After its removal, she did not suffer any more pain.—l. 15.

CASE 6.

Hydatid tumour of the neck.

On one of the bodies I used for public anatomical demonstration in 1750, there was a small tumour on the left side of the os hyoides.

The tumour being laid quite bare, and detached from the left corner of the os hyoides, to which it was externally connected, represented a congeries of hydatids, not larger than the last joint of the little finger. Having pricked the edge of it, a somewhat turbid fluid immediately issued.—*Morgagni*, l. 18.

Had the man lived much longer, this might have increased so as to constitute a large tumour. However, I think that productions of this description are to be numbered with those which, in their inci-

pient state, may be dispersed without great difficulty.—19.

CASE 7.

Adipose tumour of the nates.

A man had a small tumour form in the common integuments of the nates. He was perfectly ignorant respecting its cause, and it gradually increased till it acquired the size of a child's head. It was of a globular form, was attached to the buttock by a short peduncle, and had the same appearance as the rest of the skin. It was not the seat of pain, hardness, fluctuation, or pulsation. Valsalva removed it, and I dissected the mass in his presence.

The peduncle consisted of four or five cylindrical bodies, the thickness of the little finger. Tracing the course of these bodies, I saw that the tumour was nothing else than a production of them; for, becoming very thick, unequal, and tortuous, and undergoing numerous subdivisions, they made up the whole bulk of the tumour. However, they were easily disjoined by the fingers, and in their nature and structure they resembled the *membrana adiposa*. No blood-vessels were visible except at the upper part, and there they were of a small size. The whole tumour was invested with a pretty thick skin, which admitted of division into two *laminæ*.

Morgagni, l. 23.

This case is quite distinct from encysted tumours, in which the fatty substance is contained in a single follicle, and is reproduced after removal, if the cyst itself is not destroyed. But in the preceding case the fat was included in the membraneous cells, and was of the same texture as the adipose membrane itself.—24.

CASE 8.

A tumour existed upon the thigh of a woman who died in the hospital early in 1755. It presented externally an hemispherical protuberance, and its other half was buried beneath the skin. When the skin was divided, the tumour was found to consist of an excrescence of the adipose membrane.

Morgagni, lxxviii. 6.

CASE 9.

A man consulted me respecting a tumour of a considerable size, which was pendulous from the thigh, and had nearly the form of a fig. It was of a soft consistence, and was unequal in consequence of hemispherical protuberances, which, however, were not larger than the point of a man's little finger. When extirpated it weighed five ounces, and on examination it was found, like the former, to be an excrescence of the adipose membrane. The peduncle was of the same nature as that which has been described above.—*Morgagni*, lxxviii. 8.

Adipose tumours have sometimes enlarged to the weight of sixty pounds.*—9.

Excrescences of a nature similar to those of which I have just spoken exist not only in the adipose membrane, but also in membranes situated internally, and particularly the omentum.—*Morgagni*, l. 25.

* Tumours of this description are designated by Mr. Abernethy *adipose sarcoma*, and they occur so frequently that it was scarcely necessary to adduce the foregoing examples. In the medical records of this country we have had instances of adipose tumours weighing upwards of 20 lb. and I recently saw one removed from the abdominal parietes of a man, by Sir Astley Cooper, and this tumour weighed 37 lb. 10 oz. The patient recovered without any untoward symptoms. See *Medico-Chirurgical Transactions*, vol. xi.—*Ed.*

Small tumours have unquestionably been found on the tongue, but enlarged papillæ are liable to be mistaken for tubercles or verrucæ.—26.

Strumous enlargement of the glands.

Strumous tumours form upon different parts of the body, but especially in the glands of the neck. It has been said that they originate from mesenteric disease, but although this is pretty generally the case, it is not universally so.—28.

The following case was communicated to me by Laurence Mariani and his son-in-law Joseph Boni, in 1752.

CASE 10.

A youth, fifteen years of age, who had been healthy from infancy, began to observe an enlargement of the small glands in the neck, three months after a severe mental impression. Not only were the salivary and axillary glands affected, but others on the back, thorax, and especially about the clavicles, in which parts they had acquired the magnitude of a pigeon's egg.

Tumours of the same description were afterwards perceived in the integuments of the abdomen, and even in the abdominal cavity, where they were perceptible to the hand. They were all free from pain, except one tumour three digits long, and of a livid hue, which was situated upon the pectoral muscle. This tumour was somewhat painful on being touched. The parts within the abdomen were also painful on pressure, especially on the left side, where there was great tension and resistance.

He had acute pain in the knees, symptomatic fever, and watchfulness; and in the progress of the disease, which was rapid, he became greatly emaciated.

Dissection. The external tumours were found to be seated in the membrana adiposa, which, in those parts, was closely connected to the subjacent muscles. All of them were full of a whitish matter, which, in part, was rather fluid, but most of it was solid and sebaceous. Some of the more prominent of these abscesses, as those for instance, which adhered to the pectoral muscles, making one continued body with the axillary glands, when cut into, discharged a yellowish purulent matter.

The whole omentum was beset with hard corpuscles full of white matter. Similar strumous tubera, from the size of a hen's egg to that of a pigeon, occupied the peritoneum, the pancreas, and mesentery. The tunica adiposa of the kidneys was exceedingly thickened—towards the vertebræ it was two digits thick, and at the opposite parts five digits; being universally distended with the same kind of matter as that of which I have spoken. The left kidney, with the addition of a hard and strumous line which intersected that matter, weighed about thirty-six ounces. Not only were the adipose appendiculæ of the colon affected with tubercles of the same description, but even the ligamentous bands. In some places the glands of the small intestines were enlarged.

In the mediastinum there was one tumour of the same species as those described. It was as large as a hen's egg, and compressed the trachea. There were many others of a smaller size. The outer surface of the lungs exhibited hard and stony globules, the size of grains of barley. Posteriorly these viscera were hollowed out by strumous tumours situated in the costal pleura, and the exterior surface of the right auricle of the heart was granulated by similar corpuscles.

In general, these tumours were encysted, and they were distended with a tophaceous, hard, and rather

sebaceous matter, deposited within the cells of the adipose membrane, besides the equally hard glandular bodies which have been described.

Morgagni, lxxviii. 12.

Some of these tumours occur in parts where, in the natural state, glands are not visible. They have been seated upon the mesentery, the omentum, the stomach, the intestines, the pancreas, the urinary bladder, the peritoneum, the liver, the spleen, the kidneys, the ligaments of the uterus, the diaphragm, the mediastinum, and even the dura mater of the cerebrum. The contents of these strumous glands vary, but sometimes, except in being enlarged, their texture does not appear unnatural.—14.

Bronchocele.

It is said by John Friend, that enlargement of the thyroid gland, which has improperly been denominated bronchocele, ought to be regarded as a strumous affection. In the great number of swelled necks which I have dissected, and which were supposed to be examples of bronchocele, I have uniformly found the disease in the thyroid gland. However, the lesions of this gland are extremely various.

Morgagni, l. 30.

In the neck of one woman, dissected in 1741, the enlarged gland was somewhat roundish in its figure, and totally conglobate. Its texture was hard, and even scirrhus. In some places a white substance was intermixed with substance of a brown fleshy colour.—31.

In the same gland of another woman, I saw many pretty large portions of a white substance intermixed with the substance of both lobes, but especially the right. The left lobe contained a cyst, consisting of a thick and white coat, and containing a yellow humour, of a somewhat dense consistence.—32.

In the neck of a man dissected about the same time, one lobe of the thyroid gland was larger than the other. The enlargement was occasioned by a membranous bladder, half-buried in its substance, and when it was perforated, a viscid and yellow fluid resembling bile was discharged.—33.

The thyroid gland of a woman, larger and more prominent than it usually is, was removed for demonstration, and exhibited globules partially protuberant, and in part buried within the glandular substance. They were of a round figure but of different magnitudes, the largest being equal to the bulk of a middling-sized grape. They contained a limpid fluid like water.—34.

In the thyroid gland of another woman I found a small white body the size of a vetch, having nearly a bony hardness.—35.

Many other anatomists have met with hard bodies in this gland, and sometimes the gland itself has been found bony.

The body of a young man, who died of ascites, was brought into the theatre in 1747. The thyroid gland was thicker than usual, and the lower part of one of its lobes was indurated. This was found to arise from round vesicles full of mucus.—36.

On one occasion the thyroid gland was much enlarged, and it appeared to be made up of small lobes in the middle of which was found a globule full of fluid which greatly resembled oil of almonds.—xxiii. 4.

Enlargement of the thyroid gland occurs most frequently in females. Sometimes it takes place in one lobe only, but this circumstance must not lead us to infer that the gland is not solitary, for the same thing occasionally happens in the liver and spleen.—l. 37.

There is a species of tumefaction which some-

times occupies the limbs, and even the structure of the muscles becomes changed in a surprising degree. A nobleman of this place was affected with this disease in one of his legs.

SECTION III.

DISEASES AND INJURIES OF BONES AND JOINTS.

Exostosis.

From tumours of soft parts we proceed to those of the bones, and I prefer comprehending them under the general term exostosis.—*Morgagni*, l. 56.

This arrangement, however, is not sufficient, except in a general way, because there is great discrepancy in the nature of the tumours which form on bony structures. In some there appears nothing unnatural besides an enlargement or excrescence of the bones, and this Mery considered as the common exostosis, and Bidloo as the only form deserving the name; but there are other cases in which the tumour is united with caries, and to these productions the same appellation has been applied. However, both kinds will admit of subdivision, for the tumour which is not carious is either composed of a dense and solid substance, or of a substance wholly cellular or spongy.* The latter appearance was observed by Ruysch in a thigh bone which was increased

* Morgagni distinctly alludes to the two forms of exostosis periosteal and medullary. The former arising from a deposition of osseous matter between the periosteum and bone, and the latter from the medullary membrane and cancellated structure of the bone.—*Ed.*

an inch in thickness. The same author, too, has delineated a tibia, the exterior substance of which was very thick, hard, and compact; but its interior was cavernous. The tumours of a carious bone are either the consequence of caries from external injury, or, as it more frequently happens, from an unhealthy condition of the fluids, whether that condition be owing to lues venerea or to any other cause.

These tumours differ from each other, whether we consider the diversity in the magnitude of the cells, or the variety of matter contained in them.

When the enlargement takes place at a joint, though it might not contain any thing unnatural, yet the protuberance itself may impede the motions of the joint by stretching the tendons situated upon it. This effect, however, has not always resulted. Concerning a Roman matron, Eustachius relates that the inferior processes of the femur had acquired the size of the largest human head, nevertheless she retained the free use of the joint. Though the processes were so enlarged, yet they preserved their natural figure. Sometimes this articular surface has become flat; or, instead of being convex, it has been somewhat excavated, when the motion of the joint must necessarily be impeded.—57.

Exostosis is not confined to the bones of the limbs. I have seen an example of it in the clavicle, which had formerly received a blow. The protuberating bony substance was of a large size, and of a spheroidal figure.—58.

A thickened and indurated state of the ligaments is liable to be mistaken for exostosis. Boerhaave suggested that the true exostosis may arise from obstruction in the periosteum, and it afterwards becoming bony; or in consequence of the lamellæ of the bones receding from each other. He wit-

nessed the bones of the cranium four times thicker than they usually are, and wholly fungous, so as to resemble pumice stone. Duhamel excited the first-mentioned species of exostosis in living animals, and examined the parts in their various degrees of induration; but he was unable to produce spongy exostosis. Relative to that kind of exostosis which has been ascribed to a recession of the bony laminæ, it has been thought this could not happen while they remained hard and rigid; but that they must have returned to the nature of cartilage. Many examples of this change certainly are extant. In cases of *spina ventosa*, not only in children but in adults, Heister more than once found the bone soft enough to admit of being cut with a knife, and he supposes this degeneracy of structure may arise from the venereal disease, scrofula, smallpox, and even rickets; for it is certain that rickety children are liable to an expansion of the extremities of bones. Heister thinks that the bony laminæ are softened by the morbid humours, and when softened that they are urged outwards by the accumulation and pressure of those fluids. I have scarcely any doubt that this explanation or a similar one, will be adopted in reference to those tumours which are surrounded by soft bony lamellæ, though some hesitation may be felt with respect to those in which though the laminæ were perceived to be universally rigid and hard: the bulk, nevertheless, continued to increase.*—59.

* That expansion of the bones which has been designated *spina ventosa* cannot, with propriety, be regarded as exostosis. It generally appears to be a scrofulous disease, originating in the cancellous structure, and particularly affects bones, or portions of bones, which have a spongy texture, as the extremities of the cylindrical bones, and the bones of the carpus and tarsus.—*Ed.*

CASE I.

Medullary exostosis.

On the femur of a man brought into the college for dissection in 1732, there was a spheroidal tumour. When cut with a saw in a longitudinal direction, I found that it consisted of bony cells, which abounded with a liquid medullary oil, of a yellow colour; and the cavity of the bone corresponding with the protuberance was filled with a large quantity of the same kind of oil. Although the weather was cold, and other fluids were frozen, yet a part of this oil had not concreted in the least. In the farther cavity of the bone the marrow was of a reddish colour and concreted.—60.

Whether the altered quality of the medullary oil in and about the exostosis, was the consequence of that bony tumour, or had preceded it, I leave undetermined.—61.

In numerous instances blood has been found extravasated in the medulla of bones. A case fell under the notice of Morand in which the os femoris, at the external trochanter, and the extremity of the fibula, were enlarged. The calvaria also had acquired twice its natural thickness; but when the blood, lying between the two tables, was removed by continued pressure, the cranium became very thin.—*Morgagni*, lxviii. 4.

Mollities ossium.

In a case which occurred to Ludwig, some of the bones had become so soft as to yield to the slightest impression of the finger; and others were so attenuated in their external laminæ that the subjacent cells could easily be seen through them. In the

former the outer lamina was, in some places, reduced to the form of a membraneous sheath. This was the case with the femur and tibia. Their solid substance had been absorbed, and probably was evacuated with the urine, for there was a surprising quantity of sediment in this fluid, and it was of a peculiar nature, being of a white colour, cretaceous, and soluble in vinegar and other acids.

Morgagni, lxxviii. 4.

CASE 2.

A woman who had completed her fiftieth year was attacked with pain in the lower jaw, sometimes accompanied with profuse hæmorrhage from an abscess in the neck, to which, had the bleeding not ceased, it was intended to apply the actual cautery. Soon afterwards she was afflicted with pains in the bones, and when she had undergone that suffering for a long time, she complained, as often as she was moved, that her bones were broken; and the persons who stood near, heard a crepitus in the articulations at the time. The bones of the lower limbs began to bend as if they were made of wax.

Dissection. The ossa innominata, the ossa femoris and tibiæ, the bones composing the arch of the cranium, the ribs, the bones of the feet, and of other parts were found to be as flexible as if they had been made up of pretty thick paper. On their surface they were spongy, and in some places, internally, they were carious. They admitted the scalpel like cartilage; and all the bones which yielded to the force that bent or compressed them, discharged a fluid similar to diluted blood.—*Valsalva*, lviii. 4.

Valsalva preserved these bones, and I observed that the oblong ones were curved into the form of

an arch, and the bones which constituted the vault of the cranium were flattened. All the bones were of a bad colour and exhaled an offensive odour, because they could not be cleaned internally.

Morgagni, 5.

In other cases the bones have become flexible like fleshy substance, and were impregnated with a bloody serum. Haller relates an instance in which the fibula had become entirely fleshy, or like soft cartilage, though the periosteum had not undergone any change. The bone was tumid and internally carious. In a case related by Boerhaave the bones are said to have been reduced to a pultaceous consistence.*—6.

* Little more is known respecting the nature of that extraordinary flexibility of the bones which constitutes *mollities ossium*, except that there is a deficiency of earthy matter in them, either in consequence of excessive absorption, or of a defect of ossific secretion. The strongest cylindrical bones may be reduced to a cartilaginous softness, and admit of being bent in any direction; consequently the disease differs from rickets, in which the bones become distorted by slow degrees, and retain their natural inflexibility.

The melancholy spectacle which rickety children often present, cannot but awaken the liveliest compassion. There are many circumstances which often impart to the disease a strumous character, but its causes are involved in so much intricacy, that it has been attributed to scurvy, syphilis, dentition, and various other sources, as well as scrofula. There is little doubt that the causes vary, and must be sought for in the peculiar circumstances attendant upon individual cases. The means by which children regain perfect health after having shown a rachitic disposition in the distortion of their limbs, the enlargement of the articular epiphyses, and their general expression, would lead us to suppose that it sometimes, at least, exists independently of any specific diathesis. The process of reparation in rachitis has been elucidated in an interesting paper by Mr. Stanley, published in the seventh volume of the *Medico-Chirurgical Transactions*.—*Ed.*

Fragilitas ossium.

The bones sometimes become brittle. In a woman, who by a slight effort had fractured the os humeri, and soon afterwards the os femoris, Lovisius found the bones dry and fragile. The medulla was likewise dry, friable, and quite loose from the parietes of the bony cavities. She was sixty years of age, cheerful, and had enjoyed good health except having been afflicted with cancer in the mam-mæ.*—*Morgagni*, lviii. 7.

Caries.

An old woman in the hospital of incurables at Bologna had so much of the left os sincipitis, and of the neighbouring part of the os frontis destroyed by venereal caries, that the brain was denuded to an extent of three digits in every direction. It could be distinctly observed that the brain and radial arteries pulsated together. The woman was not affected with conyulson, paralysis, or any other symptoms of lesion of the brain or of its membranes.

Morgagni, lviii. 11.

It is surprising that this disease in the bones some-

* As in the diseases referred to in the preceding note there is a deficiency of lime, in fragilitas ossium the proportion of animal matter seems defective. It is most frequently an attendant upon advanced age, and the morbid brittleness is so extraordinary, that the os humeri has been fractured by the patient's merely leaning upon the arm of another person. A lady, seventy years of age, who appeared in good general health, is said to have fractured the os femoris by kneeling down; and on being taken hold of to carry her away, without any violence, the os humeri was broken. I have known the bones fractured by the sudden action of the muscles, and, indeed, a case is on record in which the patient could not turn in bed without breaking some bones.—*Ed.*

times happens whilst the muscles and integuments, above the bone, betray no morbid appearance; but, in other cases, the muscles and integuments above, and the membranes of the brain beneath, participate in the disease.—12.

Morbid appearances in the joints from gout and other affections.

Gout is a disease which generally attacks the rich, but dissections are usually performed on the bodies of the poor; therefore the observations relating to gout, in anatomical writings, are much fewer than those which relate to most other diseases. Examples of this disease have been adduced in former parts of this work, and therefore I have but few to subjoin.—*Morgagni*, lvii. 1.

CASE 3.

Disease in the cartilages of the hip, supposed to arise from arthritis.

A woman had frequently been affected with sciatic pains in the joint of the right femur, and on that side she was lame and somewhat distorted.

Dissection. The head of the os femoris was not rounded into a globular form, but was depressed; and instead of being covered by a smooth and white cartilage, this substance was of an ash colour. At the posterior part the cartilage was deficient, so that the bone exhibited numerous roundish and protuberant particles. The inner surface of the acetabulum was bloody, and its supercilium had two bony laminæ, not of a very small size, imbedded within its natural cartilaginous and ligamentous substance.

Morgagni, lvii. 2.

Here there was no disease or deposition of cal-

careous matter around the joint, but the whole disease was situated within it.

Fernelius believed that the arthritic humour never, or, at least, very seldom penetrated the cavity of the joints, but affected the surrounding ligaments, membranes, and tendons; and in a priest afflicted with gout, Valsalva found the calcareous matter had been deposited in the theca of the tendons of the fingers; but there cannot be a doubt that the glands which secrete the synovia sometimes deposite the chalky substance, when the blood is loaded with its particles. When it has accumulated within the joint and has concreted, the bones become separated from each other, the ligaments and skin burst, and the concreted substance is removed in pieces from the joint.—3.

The feet are more frequently affected with gout than other parts of the body, which may arise from their greater exposure to cold, the pressure of tight shoes, the languid state of circulation, and diseases in the absorbents.

Brasavolus has related the cases of two illustrious young men, who began to suffer from gout when they were only fifteen years of age. I am less surprised at this circumstance in consequence of having seen little children who were afflicted with severe pains in their joints before they had fully emerged from infancy; and I knew, at the same time, that their father, grandfather, and great-grandfather, had been subject to the gout.—4.

Paroxysms of gout suspend other diseases.

It frequently happens that a paroxysm of the gout suspends or removes other disorders, which are uncontrollable by every artificial expedient. The wife of Gerbezius, who, for a long time, had suffered severe pains in the thorax and stomach, obtained

immediate relief from them by the supervention of gout. My own eyes were affected with inflammation which approached chemosis, and I had employed various remedies without deriving any advantage from them. After bathing the feet in warm water, and using gentle frictions, for two evenings, the gout attacked me in the joint of the toe. The pain gradually increased, and the ophthalmia immediately abated, and in a few days wholly disappeared. On the contrary, when gout is repelled from the limbs, it occasionally produces the most alarming symptoms; and sometimes fatal consequences ensue from its invading some of the viscera of the abdomen, of the thorax, or the brain.—9.

CASE 4.

Metastasis of gout ; renal calculi.

George Corneli, a cardinal of the Roman church, was subject to pains in the joints, and in the kidneys. Having voided some calculi he lost all symptoms of the kidneys' being affected, but, at times, his arthritic complaints returned. His bowels were constipated, he had a sense of heaviness of the head, accompanied with dulness of hearing, with a propensity to sleep, and frequent swoonings; and his advanced age and corpulence prevented him from taking his wonted exercise. In this state he had scarcely passed his sixty-fourth year, when he lost his appetite, and was attacked with an arthritic paroxysm. His right hand and left knee began to swell, and at that period he received intelligence of the death of his brother to whom he was strongly attached, and the event occasioned him an incredible degree of grief. The gout ceased in the limbs; tightness and oppression at the præcordia, and difficulty of respiration came on; and occasionally he was attacked with

sudden paroxysms during which the functions of the brain and heart were partially suspended. His pulse became intermittent, and though in one day, while the knee swelled, the pulse improved, yet the powers of life were so much impaired that he died soon afterwards.

Dissection. The mesentery and small intestines were loaded with fat. The stomach was large and its coats extenuated. The gall-bladder was small, and contained a calculus; and its coats were so thin and flabby as to lacerate by a touch. Both the kidneys exceeded their natural size, but the right was the largest, and, with the investing fat, it almost equalled the size of a man's head. It contained eleven calculi, and most of them were ramified, and of considerable magnitude. The left contained a solitary branched calculus. In appearance these calculi resembled black coral, and that part of the substance of the kidneys which lay in contact with them was hard and callous.

The cartilages of the trachea were hard, the aorta was somewhat dilated in the thorax, and in its course through the thorax and abdomen, some ossification had taken place. The blood in the heart was frothy. Serum was deposited within the cranium, and the whole substance of the cerebrum was exceedingly flaccid.—*Morgagni*, lvii. 10.

In this case there was great complication of disease. The deliquia and intermission of the pulse were ascribable to the state of the aorta, whilst the power of the heart itself was impaired by the condition of the brain. The blood circulating through the body was not healthy, for a stomach so lax and extenuated would be incapable of properly digesting the alimentary substances. Nor were the intestines in a suitable condition to convert those substances into chyle, for no bile descended

into them from the gall-bladder, and only a small quantity had been transmitted thither for a long time, and that was of an unhealthy quality. This circumstance was demonstrated by the calculus, the smallness of the gall-bladder, and the constipation of the bowels. Renal calculi are a frequent concomitant of gout.—11.

As there is a considerable analogy between rheumatism and gout, I shall subjoin two observations in relation to that disease.

In the dissection of a rheumatic patient, Drelincourt found a gelatinous substance concreted on the surface of the muscles, two or three ducats in thickness.—16.

I am indebted to Mediavia for the following case.

CASE 5.

Morbid appearances after rheumatism.

A young man, who was a goldsmith, had violent pain in his right lumbar region, and it yielded to no remedy. A year having elapsed, the pain began to attack the left side also, and he experienced some pain in his neck which seemed to be rheumatic. An inability to move his legs followed, the abdomen became tympanitic, and he died about the middle of April 1753.

Dissection. We were only permitted to examine those parts in the loins which had been the seat of the obstinate and violent pain. In the cells of the adipose membrane some watery fluid was deposited. When the tendon of the latissimus dorsi was removed, we observed that the thick fleshy mass which affords a common origin to the sacro lumbalis and longissimus dorsi muscles was greatly discolour-

ed, so that, for the space of five digits, it resembled old furniture made of the nut-tree. This appearance was observable also in the subjacent sacrolumbalis, and in the quadratus lumborum muscles. The fibres within this space were astonishingly flabby, and were disjoined by numerous coagula of blood. These disorders were increasingly manifest in proportion as the muscles were situated near the spine. Both loins were affected, but the disease was slightest on the left side.—*Morgagni*, lvii. 17.

The affection of the neck may be accounted for from the circumstance that the longissimi muscles, whose origins were found diseased, are continued to the neck. The inability to move the limbs may be ascribed to an affection of some of the nerves which contribute to form the crural; and possibly the disease might also have extended to the psoas muscles.—18.

There are other affections of joints besides those which arise from gout.

CASE. 6.

Disease of the cartilages of the knee.

In the knee of a woman, who died from apoplexy, that part of the cartilaginous crust of the patella, corresponding with the external condyle of the femur, appeared as if it had been rubbed away, and was marked with slight and small parallel furrows, as if the point of a chisel had been drawn along it. A great number of globules were prominent within the joint. The five largest were nearly equal in magnitude to middling-sized grapes, and of the remainder, upwards of twenty, some were a little smaller, and others very much so. The larger adhered to a cartilaginous crust, or rather to the fimbriæ of a synovial gland, which closely covered the

cartilage in some recesses of the bones ; and the smaller were adherent to the capsular ligament.

These bodies were white, and had a smooth surface ; some of them were bony, and others contained a bony nucleus beneath a cartilaginous crust.

Morgagni, lvii. 14.

Cartilage ulcerated ; loose bodies in the joint.

In another case I found the cartilage of the patella eroded to a small extent. Haller found one of the articular processes of the lower maxilla stripped of its cartilaginous crust, and the lunated cartilage was almost half destroyed and perforated. In consequence of attrition, the cartilages which had been removed were converted into nearly twenty half-bony globules, which were loose in the cavity of the joint.—15.

Injuries of the bones and joints.

Fracture of the hip-joint.

So far as I am aware, fracture of the neck of the os femoris was first observed by Parey. It is distinguishable from dislocation with some difficulty, and, owing to the various impediments which present themselves, the reunion of this fracture takes place but seldom. Ruysch dissected the bodies of eight persons whose lameness had been attributed to luxation, but he found a fracture of the femur at its neck. Cases have also been mentioned by Cheselden, Erndlius, and Borstius. Ruysch has demonstrated the head of the bone reunited with the femur by means of strong ligaments, which occupied the place of the cervix.—lvi. 2. 4.

Salzmannus states that luxation of the hip joint happens with most facility when the ligaments are

relaxed from gout, when there is paralysis of the surrounding muscles, when the acetabulum is large or its margin is fractured or imperfect, or when tumours have arisen within it. For though the cause itself may be insufficient to force the head of the femur out of the acetabulum, yet, if any external violence should then be applied, dislocation will readily ensue. It has also happened, as in the case related by Nicolaus, that the ligamentum teres has been totally wanting.—5.

When the os femoris is dislocated, or its cervix is fractured, and the bone remains displaced, a new acetabulum is sometimes formed. In a work published under the auspices of Gaubius,* a case is related in which both thigh bones were dislocated. The head of the right femur was sound, but that of the left was destroyed by caries. A new acetabulum in the ossa ilii, corresponded with each of the heads. The left was slightly hollowed out, but the right was very deep. The old acetabula were nearly obliterated.—6.

The following instances confirm some of the preceding remarks.

CASE 7.

Luxation accompanied with laxity of the ligamentum teres.

A woman, sixty years of age, labouring under difficulty of breathing, dislocated the os femoris by a fall. Fever came on, which increased the dyspnœa, and she died on the eleventh day.

Dissection. The liver was indurated and there was fluid in the thoracic cavities. The luxation of the femur appeared to have arisen from relaxation of the ligamentum teres.—*Valsalva*, lvi. 7.

* De modo quo ossa se vicinis accommodant partib. § 42.

The following case was communicated to me by my pupils.

CASE 8.

Fracture of the cervix mistaken for dislocation.

A countryman having fallen from a tree was supposed to have dislocated his femur. The surgeons attempted to reduce it, but their efforts were in vain, and some of the young men, who had repeatedly heard me state that from external force a fracture of the cervix happens more easily than a luxation, ventured to suggest that it was a case of fracture. The senior surgeons, however, would not relinquish their first opinion; but at the end of two months, when the man had not risen from bed, he was seized with thoracic disease and died.

Dissection. The cervix was observed to be fractured through the middle, so that one half adhered to the head and remained in the acetabulum.

Morgagni, lvi. 9.

CASE 9.

The cervix of the femur absorbed after fracture.

A woman, about forty years of age, lame on the left side, had recently received a violent contusion on the lower ribs, and being seized with fever she was carried off within fifteen days.

Dissection. The left leg was four digits shorter than the right, and the heel was turned outwards. The right iliac vein was wider than it usually is, whilst the left and its branches were exceedingly slender, and pale. On opening the vena cava, instead of the orifice of this iliac vein I found a line which defined its coalition, and in this line two or three small orifices communicated with the iliac

vein; and having cut into it, I observed a kind of fasciculus of fibres projecting internally. Quite to the ham the vein appeared a third smaller than the opposite; and though the coats did not coalesce, blood had coagulated between them. The os femoris was deprived of its head and neck. The former remained in the acetabulum, though the cartilage with which both these parts were incrustated was ulcerated in places, and the bony substance of the head was not quite healthy. There remained no trace of the cervix, with the exception of some osseous fragments adhering to very thick and hard ligaments, into which the capsule appeared to have been converted. At least, these ligaments were produced from the margin of the acetabulum and extended to that part of the upper extremity of the femur whence the cervix formerly arose; and they connected the femur to that margin. The cavity between them, instead of being occupied by the cervix, was filled with a small quantity of matter of a thickish consistence, and of a fleshy colour.

The os innominatum, on the left side, projected forwards more than the right: consequently it was probable that the same external violence which had fractured the cervix of the os femoris at a very early period of this woman's life, had also luxated the os innominatum.—*Morgagni*, lvi. 10.

The disappearance of the cervix is attributable to the long-continued friction of the broken bones. When the periosteum has been lacerated by a fracture, it frequently becomes thickened and hardened; and it may be perceived by the preceding case, that the same thing occasionally happens to the ligaments. Extenuation of the iliac veins was observed in another lame woman.* The os femoris in this woman

* Vide page 402.

could not have receded far from the acetabulum, in consequence of the connecting ligaments.—11.

CASE 10.

A secondary acetabulum formed in consequence of an old dislocation ; retention of urine accompanied with a stillicidium.

A lame woman, nearly eighty years of age, died from apoplexy, or rather, perhaps, from the effects of apoplexy. For as the bladder was paralyzed, the attendants were deceived by a constant dribbling of urine, so that the state of this viscus was neglected, and after death it was found so distended with urine as to reach the umbilicus, and to occupy both iliac regions. She had been lame on the left side, and the corresponding leg was not only shorter than the right, but was much extenuated : the knee, too, was turned inwards, and the heel outwards. The veins of the opposite limb were very large, and the limb itself presented a good appearance. On exposing the left hip-joint, we found that the head of the femur, instead of being globular as usual, was almost flat, was somewhat enlarged, and was not furnished with any round ligament. It was received into an acetabulum less hollow than usual, but incrustated with cartilage. At the anterior border of this acetabulum there was another cavity much less than the former, with which nothing on the right side corresponded. Though the left acetabulum was neither higher nor lower than the right, nor was it situated more posteriorly, yet it was at a greater distance from the symphysis pubis, for the left os ilium was much more distant than the right.

Morgagni, lvi. 12.

By comparing this case with the observations of other surgeons, I have no doubt that the acetabulum

in which the head of the femur lodged had been hollowed out by the head of that bone, which long before had been displaced from its natural socket, of which a vestige yet remained. The smallness of this cavity may be accounted for from its office having ceased in early life, or from an increased deposition of bony substance having partly filled it, as happens in the alveoli after the removal of teeth.—13.

CASE 11.

Secondary acetabulum from an old dislocation.

The subject of this case was born with an equality of limbs, but he had been lame nearly the whole of his life. When very young his mother perceived that he suffered pain in the right limb, and after that period it became shorter; but though lame, by habit he was able to walk with ease and celerity.

Dissection. The anterior half of the original acetabulum remained, and in its fundus there was a substance of a pale reddish colour, which seemed morbid, and somewhat resembled glandular textures. The other half was filled with a bony substance. Above this old acetabulum, on the outer surface of the os ilium, another cavity was formed. It was constructed of a white and firm substance resembling ligament, but the structure of the border appeared of an intermediate nature between cartilage and ligament. This surface of the acetabulum was smooth except at the lower part, which was occupied by a reddish and not very small substance, ascertained to be muciparous gland. There was no ligamentum teres connected with the head of the femur, nor was this head of the usual form, magnitude, or smoothness. The bony substance was deprived of its cartilage. The surface was firm, hard, of a white colour, and granulated as urinary calculi sometimes are.

The spine was a little distorted in consequence of the weight of the body being thrown to the left side.—*Morgagni*, lvi. 14.

In other works similar instances of what is denominated analogous articulation are recorded ; and numerous cases of dislocation from external injury, and from disease in the acetabulum, are extant.*—15.

CASE 12.

Disease in the ligamentum teres.

An elderly woman was so lame, in consequence of a contusion on the coxendix, that she was confined to bed for a long time. Pain throughout the body, and gangrene of the nates coming on, she died.

Dissection. The liver was tuberculated, and the valves of the heart were ossified. On examining the hip of the lame side, the ligamentum teres was found thinner and less firm than usual, and was almost wholly tinged with a pale red colour.

Morgagni, lvi. 17.

CASE 13.

Diminution of the iliac artery ; slight disease in the cartilage of the hip-joint.

Another old woman crooked from age, and ac-

* In the formation of a new acetabulum under these circumstances, the resources of nature are beautifully exemplified. Not only is a cavity formed by the process of absorption, but ossific secretion takes place in the circumference, so that the joint may become adequate to the ordinary purposes of locomotion. In *Morgagni's* instances, indeed, the border of the new acetabulum was not bony, but its structure was perhaps equally efficient for the prevention of displacement.

In his *Practical Observations in Surgery and Morbid Anatomy*, Mr. Howship has not only related instances of the formation of a new acetabulum, but he has delineated the appearance with his usual accuracy.—*Ed.*

customed to walk as if she was lame, fell down stairs and injured her head; and this accident occasioned her death.

Dissection. The left iliac artery was much smaller than the right, and through nearly the whole course from the place at which the hypogastric artery is given off to that where the iliac emerges from the abdomen, its parietes were so thin that it resembled a vein. There was nothing discoverable in the joint to account for the lameness, unless we can allow that two spots, of a brownish colour, similar to the marks occasioned by a slight contusion, might tend to produce it.—*Morgagni*, lvi. 18.

Lameness sometimes arises from diastasis or a separation of the os sacrum from the os innominatum, of which circumstance Bassius has adduced examples from children who were lame.—22.

In the cavity of the acetabulum, the size and figure of the ligamentum teres and head of the femur, may be impaired in various ways. Tumours may form in the ligament or in any other part of the acetabulum. The synovial gland is sometimes diseased, and if it enlarges considerably, the limb will be elongated. The capsular ligament is susceptible of disease; and paralysis and other affections of the muscles may be a cause of lameness, as well as the shortening of the limb, which sometimes results from fracture of the os femoris. The muscles occasionally act with such force that the trochanter minor has been detached by them. Ingrassius has described a case in which this circumstance happened to a young man in the exercise of tilting.—23, 24.

Diseases and injuries of the knee.

The knee, as well as other parts beneath the femur, is liable to most of the affections which have been mentioned.—25.

In cases of rupture of the tendons which extend the leg, or of fracture of the patella, time is of more advantage than might be expected. In an instance of fractured patella, attended by Jerom Vandelli, the union had been effected so as to leave the interval of a digit only, between the disunited portions of the bone. The man was able to use his limb freely. He slipped down, however, and bending the leg violently, the united parts were again disjoined, and could not be brought into a state of approximation. But after a long period, the patient was able to walk with celerity, and had not much lameness. Between the broken parts there was about sufficient space to receive the breadth of two thumbs, and this interval was about a digit in depth. I have seen other cases of the same description, and do not doubt that the extension of the limb was in a great measure effected by the lateral parts of the aponeurosis, belonging to the extensor muscles of the leg, which envelopes the patella.--27.

Fractures.

In the reunion of fractured bones the callus appears to be formed by the external and internal periosteum. Some applications are supposed to be capable of softening callus. Duhamel states that dripping of water, which in other respects is useful, when too freely used has sometimes softened callus to such a degree that the extremities of the bone, previously consolidated, were spontaneously disjoined. Saltzman has related an instance which is worthy of being mentioned. A soldier had been cured of fracture of the tibia, and the limb had become so firm that he could walk without the least inconvenience. Eight months afterwards, he was seized with acute fever, and it was observed that

while the fever was counteracted by the usual remedies, the extremities of the bones were spontaneously separated. Soon after the fever subsided, the tibia regained its previous firmness.

Though on examining it in the dead body, the callus may be found larger in diameter than the bone, it is sometimes much more brittle. In texture, also, it does not resemble the hard bone, but is of a spongy nature like the diploe of the skull.
—29.

On boiling in a lixivium bone which had been fractured but long reunited, the callus has been softened, and the fractured parts have separated.

Separation of epiphyses.

The separation of the epiphyses from the bones, a circumstance which easily takes place in children, may be mistaken for fracture. This mistake was actually committed by an experienced surgeon, in the case of a boy of noble family. Perceiving both the wrists tumid, and observing that beneath a kind of fluctuating secretion, the extremities of the radius and ulna were moveable, he accused the servant of having suffered the child to fall out of her hands so that both its arms were broken. She denied this accusation, and my opinion was solicited. Having heard that the child had undergone a severe form of smallpox a little before, I convinced the surgeon that this was an instance of separation of the epiphyses in consequence of disease in the periosteum connecting them with the bones—a result of smallpox not very unfrequent. The child was soon perfectly cured.

Nobody has witnessed a greater number of instances of the separation of epiphyses from an internal cause, in one season, than Poupert did in

that multitude of scorbutic patients which crowded the hospital at Paris in 1699. In consequence of this disjunction, it happened that if these patients were moved, the bones and their epiphyses were heard to rub against each other.

Morgagni, lvi. 34.

SECTION IV.

ON THE EFFECTS OF STRANGULATION, WITH SOME EXPERIMENTS ON NERVES AND BLOOD-VESSELS.

Suffocation from internal disease has been adverted to in the first volume, but it is well known that the same effect may be occasioned by causes which are external and adventitious.

CASE 1.

A woman, twenty-one years of age, was suspended at the gallows.

Dissection. The integuments of the back, loins, and nates, were in some places reddish, and in others livid. The mouth was distorted, and the whole of the face was at first livid, but on opening the external jugular veins it soon became pale. This circumstance showed that the blood retained its natural fluidity, which accounted for the lividness of the supine parts. The surface of the lungs, towards the back, presented the appearance of slight inflammation.—*Valsalva*, xix. 3.

CASE 2.

A highwayman, twenty-three years of age, was

executed in the same way as the woman just spoken of, and the body was given for public dissection.

Dissection. The eyes were half open. Some of the posterior parts were red and others livid. There was nothing worthy of notice internally, except that the lungs presented the red appearance attendant on inflammation.—*Valsalva*, xix. 5.

CASE 3.

The individual to whom the following particulars relate had been publicly hanged.

Dissection. The eyes were open and turgid, and the face was rather livid. Some lacteals were observed in the abdomen, about the lumbar glands, in which they appeared to terminate. The lungs adhered very closely to the pleura, and were somewhat red at their posterior part. The vessels of the dura mater were rather turgid.—*Valsalva*, xix. 7.

CASE 4.

A slender and middle-aged man, who had been subject, at intervals, and especially when walking, to a difficulty of breathing, and troublesome cough, was hanged for theft.

Dissection. The abdomen being opened for public demonstration, some lacteals were observable in the mesentery. The lungs were diversified with blackish spots, and the upper part of the right lung firmly adhered to the costal pleura. This part of the lung, to the extent of an apple, was indurated, and was tinged with a peculiar redness, as if it had been inflamed. The pericardium contained scarcely half an ounce of fluid.

The violent pressure of the halter on the neck, had broken through the muscles which connect the

os hyoides with the larynx and the neighbouring parts, so that this bone was separated from the larynx. The vessels on the inner surface of the skin which covered the cranium were turgid with blood. In consequence of congestion of blood, the muscles and other parts about the eyes appeared as if they were inflamed, and each retina was suffused with a sanguineous colour. In one ear, the membrana tympani, with the annexed ossicula, was tinged with blood; the tympanum of the other ear was less tinged than the former, but it exhibited greater redness than usual.—*Valsalva*, xix. 8.

Although, perhaps, the dark-coloured spots in the lungs may be ascribed to suffocation, yet the more considerable affection of these viscera certainly ought not to be attributed to that source.

Morgagni, 9.

The vessels of the brain were not turgid, and this circumstance may be accounted for from the halter's having been loosed and the internal jugular veins liberated, in consequence of which, the far greater part of the blood, which was fluid, readily flowed out of the sinuses and the large veins which open into them, whilst it remained in the more distant and the smaller vessels.

Littre found the membrana tympani, on one side, not only bloody as in the case related by Valsalva, but also lacerated, so that half an ounce of blood was discharged.

In the bodies of some persons who had been hanged, that celebrated anatomist Phil: Conr: Fabricius observed that the anterior lamella of the cornea receded from the posterior.—11.

From the cause in question, the parts situated in the neck sustain a diversity of lesion in different cases. In some persons one or other of the muscles are ruptured, in some the cartilages of the larynx

are broken, in some the upper vertebræ are luxated or rather fractured, but others escape all these injuries.—12.

CASE 5.

In a man who had been hanged, the sternothyroidei and hyo-thyroidei muscles were so lacerated that, about the annular cartilage, nothing except membranous substance remained in their place, and the cartilage itself was fractured. The pleura, on the left side, was beset with numerous hard tubercles, some of which were equal in size to a lentil, some to a vetch, and others to a bean.

Valsalva, xix. 13.

These tubercles were owing to a disease readily contracted from the unwholesomeness of a dungeon, where the man had been confined for about a year. Some of the tubercles were of a cartilaginous solidity. As I dissected this body, in the college at Bologna, in 1703, with Valsalva, I recollect that portions of the lung, on the side of the chest corresponding with the diseased pleura, contained a small quantity of a reddish humour. Few persons who have long been detained in prison come out healthy, owing to the insalubrious air, often conjoined with bad provisions; and also with constant grief, and an inactive life.

The lower part of the trachea has been torn from the larynx by the halter, and the larynx is sometimes fractured. It has been a subject of controversy whether the vertebræ are dislocated or not, and I may observe that neither Valsalva nor myself have ever found them dislocated or fractured.

Morgagni, 17.

CASE 6.

A young man, twenty-four years of age, was hanged in 1705, and his body was given for public dissection.

Dissection. The muscles of the larynx were very slightly injured. The small blood-vessels of the head were as turgid as if they had been injected, and presented an elegant appearance. However, I found nothing unnatural within the cranium. The sinuses of the dura mater were empty, and this circumstance did not surprise me, because, in consequence of the head having been cut off, a great quantity of blood had flowed from the jugular veins.

Morgagni, xix. 15.

The scrotum presented an appearance like that occasioned by sugillatio, and it arose from the blood having flowed into the vessels that were the least compressed, during the suspension of the body. In one of the following cases not only was the scrotum affected in the same way, but the penis was tense.—
16.

CASE 7.

Two thieves, a middle-aged man and a young man, were executed in the same way in 1706. Their bodies were taken down from the gallows sooner than usual, namely, within four hours after the termination of life; and being brought for dissection, they were still warm, notwithstanding the extreme coldness of the season.

Dissection. When the body of the middle-aged man was opened, and a longitudinal incision made into the trunk of the aorta below the renal arteries, it was observed that a considerable quantity of blood flowed both from the upper and lower orifices of the trunk. The accompanying trunk of the vena cava

was extremely distended with blood. Through a considerable track, the intestinum ileum exhibited a kind of livid redness; and, within this part, the bowel contained some lumbrici teres.

Morgagni, xix. 17.

I was unwilling to suffer the last mentioned circumstance to pass unnoticed, because even in strangled dogs I have observed an appearance resembling inflammation in that part of the bowel where lumbrici lodged, so that the phlogistic colour, accompanied with some extuberance of the intestine, defined their situation. The man in question, certainly had not complained of intestinal uneasiness, so that some motion of the worms, after his death, appears to have excited a determination of the fluid blood to that part. We may infer from this fact, that when, on opening bodies, we observe any part of the intestines exhibiting a colour like that which has been described, we must not immediately attribute it to inflammation or gangrene, unless the symptoms which preceded death, and the circumstances associated with the appearance, concur to support that opinion; because the colour may occasionally be produced after death, especially when the blood is fluid.—18.

CASE 8.

In the body of the young malefactor just referred to, the state of the scrotum resembled ecchymosis, and the penis remained tense, though about six hours had elapsed from the time of the man's death to that at which the body was opened. It was still warm and the blood fluid. The lacteal vessels were full of chyle, and the valves were distinguishable like little knots.—*Morgagni*, xix. 19.

Erection of the penis has often been observed in

strangled men, and I remember that the same circumstance occurred when both the carotid arteries were tied in living dogs.

As I have now a favourable opportunity of communicating the experiments of Valsalva on the constriction of the arteries of the neck, I shall avail myself of it, for they so far relate to the subject under consideration, as to assist us in forming an opinion respecting the causes to which the death of hanged persons is generally attributed. As the results of these experiments have varied in the hands of different persons, even from very ancient times, we must commence our history far back; and to ascertain the truth, we must reflect upon the ancient and modern experiments and compare them together.—20.

Aristotle has been considered by many as the first who mentions tying both the carotid arteries, but I believe the internal jugular veins are described by him, and not the carotids.—21.

Mountebanks and other persons have practised deceptions by tying a string round the jugular veins and nerves of a goat, so that they could privately tighten or relax the ligature at pleasure. By this means, the animal at one moment would fall down insensible and motionless, and presently afterwards leap up again. Valverdus says, *caroditibus obstructis, sive quavis tandem ratione oclusis, statim obdormiscimus. Cujus quidem periculum fecisse Realdum Columbus Pisis anno 1544, ipse vidi in adolescente quodam in frequenti nobilium virorum corona, non minori eorum terrore, quam nostrum risu, qui id incantamenti vi effici, ipsis persuadebamus.*—22.

It appears from Ruffus Ephesius that the result of compressing the arteries in the neck was known to the ancients. He says, *arterias per collum subeuntes, carotidas, id est somniferas, antiquos nominasse,*

quoniam compresse hominem sopore gravabant, vocemque adimebant. The cause of sleep, and of the loss of voice has been referred to the nerves being tied up with the artery, and it will be proper to examine the experiments of Valsalva, which having been related in a former work, it will be unnecessary to recite. Since they were published, Enslius observed that on tying these nerves, in a very young whelp, all sensibility was instantly lost; and whatever may be the cause, others have occasionally witnessed not only the same result, but even death, as I have related in the anatomical epistle alluded to. It behoves us, however, to direct more particular attention to that which is observed much more frequently, and indeed, almost universally. When Brunnerus lately repeated these experiments on a dog, and on rabbits, he never observed any thing of that nature, but rather the contrary; and his experience should be compared with that of most anatomists who have performed the experiments, particularly with the observations of Valsalva. In my remarks upon the latter I have intimated that the ligatures with which the nerves are constricted, do not all produce the same effect, and that the animals in which these nerves were cut asunder, survived longer than those in which the nerves were tied. I have also shown that they have been occasionally deceived who suppose the *par vagum* in brutes descends through the neck, disjoined from the intercostals, so that one might be tied without the other, as in the human subject. And the greater part of those who have attempted to explain the experiments, or have noticed them and the discussions on the subject, appear not to have sufficiently regarded my admonition.

We shall proceed, however, to consider the experiments of Galen and others upon the blood-ves-

sels in the neck being tied without the nerves. I mention Galen, because if any person before him tied these vessels independently of the nerves, no information respecting those instances has reached me.—23.

Galen informs us that when the arteries are tied distinctly, neither aphonia nor sleepiness results; and since the time of Hippocrates, most others, who had but little skill in dissection, have borne the same testimony. Galen also states that when the veins are tied no function is apparently lost. He applied a ligature to the carotid arteries, and the animal did not appear to suffer from it either immediately or through the day; but in one instance, having compelled the dog to run, which for a time he did without difficulty, he at length became languid, and was soon afterwards quite incapable of proceeding. Van Swieten reports that he tied the carotid arteries of a dog, but could not observe that he sustained any injury; for, eight days afterwards, he found him lively and active. Emmettus writes, that a dog in which he tied not only the carotids but the jugular veins also, remained in perfect health and vivacity for some weeks. He often repeated the experiment, and, though none of the dogs were seized with apoplexy, nor did any of them die, yet it sometimes happened that, for the space of two hours, the animals appeared sleepy. It will be observed, however, that the dog, both of whose carotids were tied by Dionis, remained sleepy for some days after the constriction, though he regained his former strength and readiness for action.

On the contrary, there are many who report consequences different from those related by Galen. Avicenna, for instance, says that the apoplectic veins (for that appellation the Arabians gave to the carotid arteries,) being tied, sense and motion are instant-

ly abolished. Among others we might also quote the experiment of Drelincurt, which sufficiently contradicts that of Galen. He thus describes it. *Arteriis caroticis constrictis, necdum reclusis, penduloque molossi capite extra mensam, veterinus illum oppressit ; at erecto capite, sinistraque aperta carotide, molossus sese concussit et exagitavit.*—24.

Amid these discrepancies we shall do well to advert to three experiments performed by Valsalva. He tied both carotids of a dog in the lower part of the neck. The animal did not appear to sustain any injury in the motion of his limbs, but his head remained hanging down, and he manifested a degree of dulness. On the following night a large quantity of saliva was discharged from his mouth, and in the morning the hebetude was removed, and the dog appeared to have a cheerful aspect. He ate the food offered him greedily, though he had some difficulty in swallowing. In this way he passed through five days tolerably well, occasionally moving all the parts of his body with facility, and walking about the house. At length the lips and head, as well as the anterior parts of the neck, began to swell ; and though he still discharged a large quantity of serum from his mouth, yet the swelling continued to increase, his strength failed, and he died on the sixth day.

On dissecting the neck it appeared that some of the lacerated parts began to be attacked with gangrene, and that there was not the least passage for any thing through the constricted arteries. The internal jugular veins contained a little grumous blood internally, but all the veins traversing the head, exterior to the cranium, were turgid with blood, though there was only a small quantity in the vessels of the brain. The brain itself, in other respects, had a very natural appearance. The tumour that occu-

pied all the external parts of the neck and head was occasioned by a deposition of serum which in its colour and consistence resembled jelly.—25.

He tied the corresponding arteries in another dog, and witnessed the same drooping posture of the head during the first days. His neck also became somewhat swollen; he manifested similar greediness in taking food, and the same impediment in swallowing as the dog just spoken of; and some debility of the muscles was manifest. It often happened that blood issued from the wound, and on the day that this circumstance occurred the dog loathed his food. However, he appeared to have fully recovered, and was killed and dissected on the twenty-third day from the operation.

One of the carotids was slightly lacerated below the ligature, and had frequently poured out blood till within a few days of the dog's being killed, when the wound had become agglutinated. Where the arteries had been compressed by the ligatures, the parietes adhered together, and were hardened into ligament like the umbilical vessels. The obliteration of the canal was so complete, that neither moisture nor air could be transmitted through it, yet none of the collateral arteries were dilated, and this was particularly observed with respect to the vertebral.

There was nothing worthy of notice in the brain, except that about the commencement of the spinal marrow a third part of an ounce of a secretion like synovia was found.—26.

In a little bitch whose carotids were tied, he observed that she was more lively than the former animals, but survived only three days, having an utter aversion to food, and barking at every body.

On dissection nothing worthy of notice was met with, though the carotids were closely tied.—27.

With respect to Galen it is important that neither

of the three dogs on which Valsalva repeated his experiment had either somnolency or aphonia. Valsalva accounted for the swelling of the neck and the deposition of serum in one dog, from the return of blood being interrupted in that part. To explain the circumstance of no effusion having taken place into the brain, nor the vessels of the brain having become turgid with blood, we have only to recollect the vertebral arteries; for though Valsalva did not perceive them to be at all widened, it cannot be denied that they must have received a larger quantity of blood in proportion as the carotids admitted less. They must also have conveyed it to the brain, and into the branches of the carotid arteries; not only into the two posterior branches, which are found to be larger in beasts than in men, but also into many smaller ones, and thus have maintained the proper circulation through the brain.—28.

I do not know that the occurrence of apoplexy, in the experiments of Galen and of some other persons, can be accounted for in any other way than by supposing a diversity of distribution in the arteries of different dogs.

As to the cause of speedy death from strangulation, various opinions have been entertained. It has been attributed to a constriction of the jugular veins, but it must be admitted that the vertebral veins would remain uncompressed. The carotid arteries are situated more inwardly than the internal jugulars, and may resist compression more in consequence of the thickness of their coats and the impetus of the blood with which they are distended. However, the internal jugular veins are also somewhat defended by the jutting of the trachea.—29.

In other experiments on the ligature of arteries, the observations of Galen and those of other anatomists are at variance. The omission of some of the

circumstantials is one reason why the experiments do not agree. Pecquet related, that having tied the crural artery, and cut the turgid accompanying vein, the impetus of the blood was so subdued, that at first it issued only in drops, and, at length, ceased to flow; but when the ligature on the artery was relaxed, blood burst from the vein with its usual force. On two dogs I witnessed the same experiment with Homob. Piso, but the result was not the same as observed by Pecquet. The blood certainly sprang from the vein with greater force when the artery was untied than when constricted by the ligature. When the artery was tied, the impetus of the blood was broken, but it did not cease to flow copiously, and with a jerk, in the first dog, which was lively and strong; and in neither of them did it distil in drops, and much less, cease to flow. In one of them the bleeding could not be entirely suppressed till the ligature, placed under the artery and vein, was ordered to be drawn tightly round the thigh. Pecquet undoubtedly met with a dog in which the branches that arise from the artery above the situation where the ligature was applied, and communicate with the crural vein, were smaller and fewer than in ours; or perhaps he made the ligature higher than we did, as we applied it a little below the groin. He ought not to have omitted mentioning in what place the artery or thigh was bound, if he desired others to witness the same phenomena as himself. Sometimes, indeed, it happens, that when the author of any experiment has omitted no circumstance in describing it, yet they who repeat it evidently make some variation, and then, as if no deviation had been made, they wonder that their experiment does not answer. —30.

To judge of the accuracy of Galen's experiment of tying the internal jugular veins, without its evi-

dently suspending any function, it is necessary to know upon what animal it was made, and in what part of the neck the vein was tied ; on both which points he is silent. When L'Amur tied the jugular veins of dogs below their bifurcations, he observed no sleepiness ; but when the ligature was made as near the thorax as possible, the dog fell into a profound sleep. I wish we had more facts of this description, and that the experiment had been continued for a longer time, but only one or two occur to me at present, and I shall adduce them below. They are rather favourable to Galen, as indeed are those of Emmettus and Van Swieten.

Other experiments have been made, but they evidently relate to the external jugulars. Though I know that these vessels communicate with the internal, and by that means, as well as by their more direct function, they contribute to the more expeditious return of blood from the interior of the cranium, yet in this office they are not to be placed in comparison with the internal jugular veins.—31.

Æderus tells us that having tied the external jugular veins in a dog, the veins above the ligature, did not swell much, nor did the dog suffer much apparent injury from the operation. He did not even become dull, but through nearly the whole of the day he was lively and constantly barking, and survived to be the subject of another experiment. Below the ligature there was a portion of vessel which disappeared on every act of respiration, but at length filled again.

Novesius thought that Lower tied the adhering lymphatic with the vein, and that on its being ruptured from over distention, it occasioned the quantity of limpid serum which resulted from his experiment. He, therefore, was careful not to include any thing with the veins, and he observed no injury

worthy of notice when the internal and external jugular veins were both constricted.—32. *A*

Among the papers of Valsalva I have not discovered any thing relative to the tying of these veins, yet I found other observations relating to them and the carotid arteries that were opened or laid bare, which I shall describe, and shall concisely add what presented itself to me on repeating the same experiments. Valsalva having laid bare the jugular veins, observed that they were distended with blood, but their turgescence decreased during inspiration, and in expiration they again became turgid, especially when respiration approached its natural state. In other dogs he witnessed the same occurrence, and perceived that there was a kind of systole and diastole in these veins. Besides, on compressing them, he saw the blood which was below the compressed part flow back towards the heart, though it was not urged from above.

In another dog he divided the carotid artery, and saw that the blood flowed from the upper part of the dissected artery, and though the impetus was less than from the lower orifice, yet the quantity of blood was not small. From the communications which take place between the branches of both carotids, he expected this circumstance to occur.

In 1750 Schlichtingius published some observations which excited several persons to the inquiry why the brain is raised up during expiration and subsides during inspiration; and when men of considerable sagacity at Gottingen and Montpelier, directed their attention to this point, they concurred in the previous observation of Valsalva; and by their own experiments, they discovered the same motion in other large veins besides the jugulars. So far as I am acquainted with the subject, nobody

had distinguished this motion in veins before Valsalva.—33.

In 1723 I repeated the experiments of Valsalva myself. The integuments of a dog's neck, on the right side, being so separated that the external jugular vein was exposed, a kind of tremulous motion was observed in it, and in the adjacent denuded part of the neck. Fixing my eyes attentively on the vein, and applying my hand to the abdomen, I clearly perceived that as often as the muscles were raised by inspiration, the vein at the same time immediately became tumid, nor did its fulness decrease before the abdomen subsided in expiration. As these phenomena were contrary to those observed by Valsalva, I repeatedly noticed them with attention. The respiration, indeed, did not return to the natural state, so that on this point I could not compare my observations with his. The effect produced by compressing the vein with my finger, coincided with that described by him. We divided the carotid artery and found that hæmorrhage ensued from the upper as well as the lower orifice, as it had done in the experiment of Valsalva.—34.

We shall now return to the consideration of the cause of death in strangulated persons. Though most anatomists agree with Wepfer in the opinion that apoplexy is immediately produced from the constriction of the jugular veins, owing to its preventing the return of blood from the head, whilst some is carried thither by the partially compressed carotids, and still more by the vertebral arteries; but the preceding experiments appear to disprove this sentiment.—35.

Cesalpinus says that persons to whom the suspension had not proved fatal relate that, as soon as the neck was constricted by the halter, they were seized with stupor, in consequence of which, at

length, they felt nothing. Speaking of a man and woman who survived hanging, Wepfer tells us that the woman lay in a state which resembled apoplexy; and that the man had not experienced the least pain after the constriction from the halter, and passed some hours as if buried in a profound sleep. A man, upon whose veracity I could rely, informed me that a criminal who hung for some time but did not die, subsequently related that he first perceived sparks flying before his eyes, and soon afterwards became unconscious of every thing, or only felt as if he were asleep. A woman whose neck was bound by thieves so that they believed she was dead, was found with her face swollen and livid, and her mouth frothy. Bleeding saved her life, but many hours elapsed before she was fully restored.

I mention these cases that they may be compared with the effects of tying the veins, arteries, or nerves in the experiments on dogs; and if they do not afford the explanation, the cause of death from strangulation remains to be discovered.—36.

Undoubtedly the circumstances would be widely different if all the vessels were tied, and it is probable that in the instance of the mountebank and the goat, which has been referred to, the vessels and nerves were compressed together.—37.

Besides, it is obvious that in strangled persons, to whom the question now chiefly relates, the trachea is also constricted, and experiments are not necessary to prove that fatal consequences speedily result from a total obstruction of this canal. The entrance of foreign bodies into the larynx has often occasioned immediate death, and on this account we cannot be surprised that many eminent men have attributed the death of hanged persons exclusively to the obstruction of breathing.

Therefore, if compression upon the nerves and vessels is not thought sufficient in itself to produce the effect in question, it certainly is when constriction of the trachea is combined with it. The circulation of blood through the brain, which, when the carotid arteries and jugular veins are compressed, can but just be maintained by the vertebral arteries and veins, is certainly stopped whenever respiration is totally impeded. Under these circumstances a large quantity of blood also accumulates in the lungs, in the right ventricle of the heart, and in the vena cava. If impeded respiration alone is adequate, within a short time, to stop the circulation of blood, it must necessarily be interrupted in its course through the brain in a much shorter time, in those persons in whom the carotid arteries and jugular veins are constricted by the halter, and when so little blood is conveyed to the brain as scarcely to support the circulation of the vertebral arteries and veins. Before the transmission of blood through the lungs is wholly prevented, if it happen that some blood continues to flow through the carotids, which are less compressed than the jugular veins, so much blood will soon be accumulated in the brain as to occasion a rupture of vessels. This consequence has been observed; and in a criminal who was hanged, Peter Nanni found that the longitudinal sinus had burst.

In persons too who had been strangled, numerous bloody points were seen in the substance of the brain by Lancisi and myself.—38.

This would be the time to speak of suffocation from the vapour of charcoal, or from the gas occasionally found in vaults, wells, cellars, and similar places; and in the dog's grotto, *la grotta de' cani*, where dogs thrown in are immediately destroyed. But the body of a person whose death had resulted

from this cause, has never been brought to Valsalva or myself.—39.

Though neither of us has had an opportunity of dissecting the bodies of persons who have been drowned, yet as I formerly dissected animals of various species, which had been destroyed in that way, I shall relate the appearances presented on dissection.—40.

Three guineapigs were drowned. No water was found in the stomach, œsophagus, or trachea, but a little frothy humour could be pressed out of the lungs with the hand. The epiglottis, which in these animals is very short, was not depressed.

Three hedge-hogs were placed under water and air-bubbles escaped from their mouths. The appearances on examination resembled those in the guineapigs. In the bronchia of one of them I found a living worm, which was oblong and slender, and of a white colour.

In a mole, which was drowned with great difficulty, the stomach contained but little water, and nothing except a frothy humour could be squeezed from the lungs.

A mouse and a dormouse were also drowned, but neither the stomach nor lungs contained water, and the epiglottis was not depressed. Though it has not been distinctly mentioned, I wish it to be understood, with respect to all these animals, that the larynx was perfectly unclosed.—41.

In some new-born kittens, which lived in the water a long time, I found a considerable quantity of frothy moisture in the lungs. In kittens a few days old, which had been immersed till nearly dead, there was not only a large quantity of frothy moisture in the lungs, but the stomach contained some water, and one of them had the stomach greatly distended.—42.

From a variety of observations it appears that much assistance is not to be expected in preventing suffocation from the foramen ovale or canalis arteriosus being open. In newly-born kittens a considerable quantity of water has entered the lungs, and often the stomach; but in most adult animals neither of these circumstances has generally happened. On both these points, however, there has been some contrariety both in brutes and in the human body. In a few experiments Haller employed coloured water, and in every one of them some of it gained admission into the lungs.—43.

Infanticide.

I hasten to another subject, namely, the proof as deduced from the result of throwing the lungs into water, whether an infant has been born dead or alive. Respecting this evidence I concur with those who, though employing it, yet know that many exceptions to its accuracy have been observed within a few years. Though Galen demonstrated that the substance of the lungs in fœtuses is not only red and dense, but likewise heavy, yet I do not know that any person thought of making the experiment in question till a few *lustres* previous to my own time. It has been objected concerning an infant which might have been born alive, that the lungs may subside in water if they are not sufficiently distended in consequence of a want of strength in the infant, or if they have been consolidated from disease; and, on the contrary, the lungs of a still-born infant, may swim on the surface, if the lungs are distended with air which may have been extricated from putrefaction, or perhaps forced in with a view to excite respiration.—45.

It is necessary, therefore, to observe whether there are evidences of weakness before we infer,

from the subsiding of the lung, that the child has been born dead; and we should likewise inquire into the preceding or present diseases of the mother, the degree of difficulty attendant upon the birth, and other circumstances of this nature.

It is evident that we cannot trust to the sign under consideration, if, at any time, we observe that the lungs are not endued with that gravity which is natural and peculiar to the fœtus, but with a morbid gravity, owing to their being scirrhus, or inflamed, or so affected with infarction that if they were the lungs of an adult they could not float—a circumstance which most anatomists, as well as myself, have perceived.

That there may sometimes be pulmonary infarctions in fœtuses is not only indicated by reason, but confirmed by experience.

But if suffocation can sometimes charge the lungs with a great quantity of blood in an infant, in the same way that I have stated they have been overwhelmed with it in strangulated adults, yet suffocation cannot conceal itself under the sign in question. For though all the external marks of strangulation are wanting, yet certainly a very different state of lungs from that which is usual in the fœtus, in addition to their increased bulk, should caution us against too hasty a reliance upon their descent in water. Besides, it can scarcely happen in those who have drawn in air, but that some parts of the lungs will retain so much of it as to make them swim though the other parts descend.—46.

Notwithstanding what I have stated with respect to putrefaction, instances have not been wanting in which the fœtal lungs have sunk in water after the highest degree of the putrefactive process.—47.

We must be on our guard too, on another ground, because air might be blown into the lungs of a dead

fœtus with the malicious intention of defaming the mother. The appearance of force applied to the dead infant, especially if it does not immediately succeed its decease, is very different from the phenomena arising from injury inflicted during life; and if there are no such marks of violence internally, or on the surface of the body, it will tend to refute calumny. If under these circumstances the mother should affirm that she blew air into the lungs, we may with greater readiness credit her statement, provided none of the other circumstances indicate the contrary, and that the distention of the lungs is not greater than could really be produced by that means in a fœtus recently dead—circumstances which may be determined by careful experiments instituted for the purpose.—47.

SECTION V.

DISEASES INDUCED BY POISONS.*

On this subject Valsalva's papers do not afford me any observations. For the ensuing case I am indebted to Mediavia.

* Poisons have been divided into animal, vegetable, mineral, and aërial, and they may exert their influence upon the animal economy by being received into the stomach or rectum, by being inhaled, or by being absorbed from the surface of the body either whilst the skin remains entire, or when there is a solution of continuity from an ulcer or wound. The phenomena resulting from poisonous substances have recently become so much better understood than formerly, that I have omitted some of the less interesting parts of Morgagni's letter. Orfila's Toxicology, and other publications which embrace this important subject, are so accessible, that my annotations to this section will be limited to the relation of two interesting cases which fell under my own notice.—*Ed.*

Mineral poisons.

CASE 1.

Poisoning by arsenic.

A woman, sixty years of age, ate some small rolls of almond paste, which contained arsenic, and had been laid for mice. Scarcely had an hour elapsed before she was seized with a sensation as if the stomach were distended from flatus. This sensation increased in severity, but copious vomiting and diarrhœa coming on, she appeared to be relieved. Soon afterwards the uneasiness returned with augmented violence, and was accompanied with deliquia; and within twelve hours she died, rather from prostration of strength, than under very acute pains. The body was inspected, by public authority, the following day, May 7, 1722.

Dissection. The posterior surface of the body was universally black, the body itself was not stiff, nor the abdomen tumid. Some parts of the inner surface of the stomach were eroded, especially at the antrum pylori; and the arsenic itself was seen adhering to the eroded parts between the membranous fragments. The duodenum was not wholly exempt from erosion.

The lungs were of a blackish hue. There were two concretions in the heart, but with this exception, the blood was fluid, and of a lively red colour, in all the vessels.—*Morgagni*, lix. 3.

With respect to the diseases produced by poisons it happens, as in other cases, that neither the same symptoms nor effects can be expected in all persons, even when the poison is the same. This difference may arise from a diversity in the nature of the solid and fluid parts, especially those which relate to the

stomach, to say nothing of the emptiness or fulness of this viscus, or of the different kinds of aliments it might contain. In the *Sépulchretum*, on the authority of Wepfer, are mentioned the particulars of three individuals who were poisoned. One of them was a little boy two years of age, who had been emaciated by fever; and the others were two girls, nearly arrived at adult age, and enjoying good health. The former ate only two spoonfuls of a pudding which contained arsenic, but his stomach was empty; whilst the two others ate the remainder, but their stomachs were full of meat. The former did not vomit, but the latter retched frequently, especially after vomiting had been promoted. The girls recovered, but the strength of the little boy gradually decreased till he died. The stomach was found ulcerated, and the lungs were of a blackish colour.

In dogs that had swallowed arsenic, the stomach was inflamed, and the coats of that viscus were attenuated: the intestines were eroded and perforated, and the cavity contained grumous blood.

Mountebanks and jugglers swallow arsenic when their stomachs are full of fat and oily substances; so that serious consequences do not ensue, because these individuals privately vomit it up soon afterwards: but if, contrary to their custom, they are obliged to defer this ejection, they perish. In other cases when arsenic had been taken by mistake, upon a full stomach, fatal consequences have been averted by vomiting. Vomiting has generally resulted from taking arsenic, as well as other poisons; and the symptom next in frequency is prostration of strength, or the circumstances which denote it, as coldness of the extremities or of the whole body, cold perspirations, paleness, and sometimes syncope. The prostration of strength, which arises from the heart sympathizing with the affection of the stomach,

is preceded and accompanied with the most distressing anxiety. *Tormina* and *singultus* have likewise been experienced, as well as a tumid state of the abdomen. In some persons there is thirst; in others, swelling of the tongue, or *aphthæ*, impeded deglutition, or a sense of burning heat.—4.

In addition to the cases narrated in the *Sepulchretum*, I shall point out numerous others in which fatal consequences resulted from mineral poisons.

Bæumlinus relates that glass of antimony had been given to a coachman through carelessness. The effects were bloody stools, convulsions, and death. The stomach was abraded, and tinged near the pylorus with a red spot.

Jacobus Fælix administered tartarized antimony to a dog, and opened him while he vomited. There was violent inflammation at the pylorus to an extent of some inches.

Sproegelius relates that having given sublimate to a cat and a rabbit, he witnessed the following results. The cat was slightly convulsed, and died in five minutes; the rabbit, after vomiting, died instantaneously. In the cat, the internal coat of the stomach was universally inflamed, but the appearances indicated that the more violent inflammation had been situated at the fundus of the stomach. In the rabbit there was no appearance of inflammation, nor indeed could this have happened, for as the poison was dissolved in water, it immediately occasioned death by its action on the nerves. When *Sproegelius* had given sublimate to a dog whose stomach was empty, he found the villous coat, in this animal, every where filled with *spiculæ* of the poison, and consequently partly red and partly livid; and the mouth was in the same state: but the stomach, especially about its upper orifice, was greatly inflamed, black, and gangrenous. He opened the

animal while it was alive, after it had vomited with violent strainings, combined with inquietude and howling, for an hour or more. In none of these three animals, except the first, has he mentioned the existence of black and coagulated blood in the heart.

Jacobus Fœlix administered the same poison, with an equal weight of arsenic, to a dog. The animal instantly vomited twice, and though immediately opened, violent inflammation was observed in the stomach. Another dog to which he had given arsenic alone, was opened before its death, after having vomited nine times. He found the same appearance as in the preceding example, especially towards the pylorus, and in the adjacent intestines.

Sproegelius forced some crude white arsenic into the stomachs of a cat and dog. Straining to vomit being observed in both animals, accompanied with anxiety and convulsions, they were opened before they died. The stomach was inflamed, and blood had been extravasated between the rugæ, or among the villi, and had coagulated there: and in the dog this kind of blood surrounded the arsenic.

Cobalt, which is an ore of arsenic, having been forced into the stomach of dogs, and vomited by them without any injury, the mouth of another dog, under the same circumstances, was tied. The most violent efforts to vomit came on, accompanied with anxiety, convulsions, and weakness; and, within a few hours, the animal died.

The stomach, in some places, was a little livid, and everywhere greatly inflamed. The intestines, likewise, were inflamed, but less so in proportion as they receded from the stomach. In three cases in which cobalt had been taken into the human stomach, as related by Kundmannus, it proved fatal within a few hours. All these persons were im-

mediately seized with violent tormina, excessive vomitings, and cold sweats. The posterior parts of each body were found livid after death, the stomach was much inflamed, and a bloody fluid oozed from its eroded vessels.

The following symptoms and diseased appearances were the consequences of taking arsenic. Preussius mentions constriction of the fauces and chest, thirst, heat, gnawings, tormina, prodigious vomiting, and frequent intestinal discharges. Mullerus, besides these symptoms and pains of the abdomen, speaks of the immediate distention of this cavity, and of anxieties. Maurice Hoffman, in addition to the speedy swelling of the abdomen, notices lividness of the face and eyes, and contortions of the neck. Heimreichius mentions continual vomiting for twenty-four hours successively, with horrible clamours, tremour of the limbs, and palsy of the feet. Wolffius speaks of severe pains in the stomach and abdomen, joined with cholera morbus. Hammerus and Quelmalzius mention very severe symptoms. The former speaks of violent vomitings, great weakness, and contraction of the limbs; and the latter, of anxieties, cardialgia, swelling of the eyes and of the whole head, very severe lancinating and eroding pains of the intestines, heats, and other similar effects.

Etmuller relates the case of a girl who had taken arsenic, and who vomited a great quantity of viscid fluids in the beginning of the night, and was found dead the following morning. However, no morbid appearances were detected in the viscera which could be ascribed to the poison, although the stomach contained a white powder, which, on being thrown upon burning coals, exhaled an arsenical fume; and a similar powder, found in the house, very speedily destroyed a cat and a dog. The sto-

mach in both was inflamed, and in the dog it was eroded.

The stomach, in the girl, seems to have been protected from both these effects by the quantity of food which she had previously taken, and also of viscid matter which had been secreted; but the internal coat and nerves had been irritated.

We have on record examples of the poisonous effects of arsenic having been produced by its application to the sound skin or to external ulcers.

Tyson examined the body of a person who had taken arsenic, and the stomach was perforated by an irregular foramen of considerable size. Hoffman found the fundus of the stomach of an old woman ulcerated, sphacelated, and black.—5.

Mead entertained the idea that poisons act chiefly upon the nerves, and not upon the blood; and, in reference to some poisons which occasion death almost instantaneously, this opinion is undeniable. But as, when poisons affect the nerves, the circulation is either impeded or disordered, the blood will be found in diverse states in different bodies. Mead therefore supposed, that if the circulation is suddenly interrupted in consequence of general paralysis from poison, the blood will continue perfectly fluid in the vessels. Sometimes secretion will be suspended, as in other cases of deranged circulation; and other changes take place on the small vessels through the agency of the nervous system.

These changes in the blood, besides that they are neither the first effect of poisons nor peculiar to them, may vary exceedingly in different bodies, according to the various affections of the nerves, and the diverse conditions of the blood itself.

In nine rats which had been killed by arsenic, and were sent to me, the auricles of the heart were dis-

tended with black blood, which was neither coagulated, nor quite so fluid as in the living body. The stomach was very full in all of them, and neither it nor the intestines, as far as appeared outwardly, were inflamed in any one, much less perforated.

Ruysch never found the blood coagulated in the human body after taking arsenic, but if there had been sufficient time the stomach was ulcerated. If the persons died earlier, he saw bloody points, distant from each other, throughout the stomach.—9.

From mercurial sublimate, erosions of the mouth, œsophagus, and stomach, have been observed, as well as discharge of blood by vomiting and by stool, with tormina, writhings, deliquia, convulsions, and similar symptoms.

When this poison has been administered to animals, it has sometimes occasioned death within a few minutes.

The observations of Ruysch, united with others alluded to above, render it evident that the first effect of arsenic, or of other corroding poisons, when taken into the stomach, is exerted on the internal coat of the alimentary canal, especially of the stomach. The nerves of this coat are irritated; and, if time be given, the coats themselves are inflamed, ulcerated, and perforated.*—10.

* *Poisoning from arsenic.*

A young man who had become rather melancholic in consequence of the inconstancy of his favourite lass, one morning, at five o'clock, took about an ounce of oxide of arsenic, in a very coarse state. His groans soon afterwards attracted his father to his room, when he complained of severe pain in the stomach, and vomited excessively. At seven o'clock these symptoms continued with unabated severity, and, from the appearance of the matter vomited, his father suspected that he had taken some deleterious drug. However, the youth did not confess his delinquency till nine o'clock. At this period he was visited by a very respectable medical gentleman, who found him in violent

I shall now subjoin a few remarks on vegetable poisons.

pain: the pulse was scarcely perceptible, he was excessively thirsty, and had voided two dejections, one of which was bloody. He died at ten o'clock, and on the following day I was requested to attend the inspection of the body.

Dissection. The body lay in the posture in which the youth expired, namely, on the right side, the left leg was drawn up, the greater part of the corpse was of a livid hue, but especially the genital organs. The eyes were unclosed, the hands clinched, the mouth tightly shut, the countenance had undergone little alteration, and the temperature was nearly as warm as that of the living body in an unexcited state. On opening the abdomen we did not observe any appearance of peritoneal inflammation; but the vessels of the stomach and intestines were so turgid as to impart to their coats an unusually vascular appearance. The stomach was large and distended, the small intestines were inflated, but the colon was contracted. The stomach contained several lumps of arsenic, and a brownish fluid, upon the surface of which floated some castor oil. These contents measured eighteen ounces. The inner coat of the stomach was red throughout, but the degree of inflammation varied. There was no appearance of erosion. The termination of the cuticular lining of the œsophagus was very strongly marked; and the development of mucous glands throughout the space extending two inches from the pylorus, was very remarkable. The state of the inner coat of the intestines resembled that of the stomach, but the appearance of erythema gradually decreased as they advanced towards the cæcum.

The lining of the œsophagus was inflamed, especially near the gastric extremity; and this tube contained fluid resembling that found in the stomach.

Near the apex of the heart there was a spot of lymph. The heart itself appeared turgid to a great degree, but by slight pressure it became remarkably flaccid, and this circumstance was explained when we opened the organ; for the blood, being perfectly fluid, had escaped into the vessels by pressure. There was not the smallest coagulum in any part of the blood which came under notice. On the attentive examination of the heart I found that within the right ventricle, to the extent of a three-shilling piece, there was an appearance of deep redness, almost as if extravasation had taken place beneath the internal lining of the ventricle;—and the inner surface of the aorta, for about an inch from its commencement, was not only of a deep red colour, which obviously resulted from inflammation, but spots of lymph also adhered to it.—*Ed.*

Vegetable poisons.

CASE 1.

A poor woman, about sixty years of age, who had several times attempted to throw herself into the river, drank a quantity of the juice of the *Rhododaphne* in wine. About three hours afterwards she was heard retching violently. She became worse, and Mediavia was called to her about five hours after she had taken the poisonous juice. Her lips, particularly the inferior labium, were of a brown colour; and the temperature of the body was somewhat lowered. Her pulse was small, weak, and hard; her voice was inarticulate; yet she pointed to the matter vomited, which was considerable in quantity. She died within four hours after he saw her. On the following day, November the seventeenth, 1745, the Judge of capital offences ordered the body to be inspected, and Mediavia presided on the occasion.

Dissection. The whole posterior parts were of a violet colour. Although it occurred in the month of November, and notwithstanding seventeen hours had elapsed from the time of the woman's death, yet a degree of warmth was perceptible in the thoracic and the abdominal viscera. The latter viscera were in a natural state externally, but the veins of the stomach, of the omentum, and of part of the intestines annexed to the mesentery, were extremely turgid. The stomach contained a small quantity of green humour; and the rugæ, near the antrum pylori, were harder than they usually are. The duodenum contained some green fluid similar to that which had been found in the stomach, and it probably consisted of bile united with acid juices.

The right lung was connected to the costal pleura: it was very red posteriorly, and something like coa-

gulated blood was observable within its substance. The left lobe was unconnected and collapsed, as if scarcely any air was left within it; and there was but little redness at its back part. There was not the smallest quantity of blood in the ventricles of the heart; but when the larger vessels of this organ were cut into, a large quantity of blood flowed out of them. This blood was neither coagulated, nor was it more fluid than natural. The head was not opened.--*Morgagni*, lix. 12.

Probably the poison had acted upon the stomach and its nerves, and, consequently, on other nerves sympathizing with them. It is not necessary that the stomach should be inflamed to induce those effects which were manifest; for irritation of the nerves may occasion all the appearances. In other cases of death from vegetable poisons no sign of visceral inflammation existed.

It must be admitted, however, that sometimes, inflammation has been discovered. The jejunum and colon were much inflamed by the berries of *Solanum*. In a case of poisoning by a species of mushroom there were marks of inflammation about the pylorus, and the vessels of the inner coat of the duodenum were replete with blood. Besides which there were slight excoriations in this membrane, and it was inflamed at the upper part, and diversified with purple spots. I have also seen inflammation produced by black hellebore.—14.

The following is the case to which I allude.

CASE 2.

A man who seemed to be nearly fifty years of age, being in the hospital on account of melancholia, was about to depart, when he took some extract of

black hellebore, by which he was considerably purged. In the beginning of the night, at the seventh or eighth hour after taking it, he was attacked with vomitings, and pains of the abdomen; but they were allayed by some warm broth. About the fifth hour of the night those affections returned, and again appeared to be relieved. He lay down an hour afterwards, having vomited two or three spoonfuls of a greenish matter. So quietly did he rest afterwards, that none of the patients in the nearest beds heard him; but at the eighth hour they were attracted to his bed-side by a peculiar noise from his mouth, and found him dead.

On inquiry I ascertained that he had taken about half a dram of the extract—a quantity which has been administered to other persons without injury. It has been customary, however, to order a quantity of whey to be drunk after taking this medicine, which he had neglected to comply with.

Thirty-eight hours after death I inspected the body.

Dissection. The limbs were not rigid or contracted. In some places, even externally, the stomach and intestines were inflamed; and the intestinum ileum was contracted in some parts and dilated in others. Internally the stomach, with the adjacent part of the œsophagus, was partially inflamed; the intestines, likewise, were inflamed, but the inflammation was not violent in either part. The spleen was a little larger than natural, and so flabby that the inner substance was almost fluid. The bile contained in the gall-bladder was of a pale green colour.

A little bloody fluid escaped from the cranium when it was cut into. There was but little blood in the sinuses of the dura mater, or in the larger

branches which ramify through the pia mater. The whole cerebrum was extremely soft.*

Morgagni, lix. 15.

** Poisoning by opium.*

On the 16th of July 1816, I was requested to attend the examination of another young man who was suspected to have committed suicide by taking opium. He had lived for a year and half with a respectable druggist, and though of a reserved and inactive disposition, the young man was sober and steady. In consequence of his friends objecting to the continuance of an intimacy with a young woman to whom he had long been warmly attached, he appeared rather dejected, but no suspicion arose as to the dreadful purpose he contemplated. On the 15th he discharged his duties and took his meals as usual. At eleven o'clock he supped, closed the shop, and retired to bed. Half an hour afterwards he was heard groaning, and was found insensible, and no efforts to rouse him availed. The pupils of the eyes were contracted, he perspired profusely, his pulse was slow and feeble, but every second or third minute he made a deep inspiration; and at that moment, the pulse was accelerated. He was bled; and a dram of sulphas zinci was administered. Other means were likewise employed, but nothing produced any sickness. He died about five o'clock, a. m. as if by a gradual extinction of life, without any convulsion.

Dissection. We observed that the arm had bled in the coffin, and blood continued dropping from the orifice. The corpse had the usual cadaverous appearance. On noticing the blood dropping, the gentleman with whom he had lived, being present, mentioned that the blood withdrawn from his arm had not coagulated in the basin. The whole of the small intestines presented an appearance of heightened vascularity. The stomach was removed, and contained, with the supper, a considerable quantity of solid opium. Having taken the stomach away I examined it very carefully. The termination of the œsophagus presented a red appearance beneath the cuticular lining. The cardiac portion of the stomach was universally brown, but the tinge was not uniform, for striæ were multiplied in every direction. They were of a deep brown colour, varying in size from the width of a crow's quill to that of a swan, ramifying like the larger vessels, and generally following their course. Though the streaks presented this appearance, yet they seemed rather

Symptoms which strongly resemble those produced by poisons are often brought on by morbid secretions in the body itself. In the appearance of the stomach after death it is sometimes difficult to discriminate betwixt the effects of poisons and injuries which the organ might receive from other sources.—19.

Though organic lesion from poison may most frequently be observed at the fundus of the stomach, yet the morbid appearances have sometimes been observed near the œsophagus, or in other parts of the viscus.

to have been occasioned by the rugæ. The villi on these deeply-coloured parts were so turgid with blood that it oozed from them on the slightest pressure. The mucus covering this extremity of the stomach was so glutinous as to resemble a cuticular or adventitious membrane. Towards the pyloric extremity the colour was variegated—namely, pale, red, and brownish. The reddened and deeper coloured parts principally consisted of prominent and turgid villi. It did not at all resemble the active inflammation resulting from arsenic, and which has been described; nor was there any appearance of enlarged mucous glands. The pylorus and the commencement of the duodenum appeared to be inflamed, and the glands of the latter were enlarged. There was erythema through the whole mucous surface of the intestines.

Blood was coagulated in the heart. The vessels of the scalp and of the dura mater were turgid, and blood had been extravasated between the dura mater and tunica arachnoides, and was diffused over the posterior lobe of the right hemisphere.

Though not connected with the cause of death it is worthy of remark that the foramen ovale was largely open, and there were excrescences on the mitral valves.

The morbid characters of this stomach, and of that taken from the person who destroyed himself with arsenic, have been preserved with the utmost accuracy in the saline solution, an account of which, for the preservation of anatomical specimens I have already published; and six years' experience has fully confirmed the advantages which I then considered myself warranted to anticipate.—*Ed.*

A case which has been transferred from Ballonius into the Sepulchretum shows how greatly we may be imposed upon by morbid phenomena in the stomach. On examining the body of a person to whom it was suspected that poison had been given, the stomach was found beset with exanthemata, and the physicians were upon the point of asserting that the appearance was owing to poison, when they were informed that the person died of measles, which began to appear on the skin and suddenly vanished.

Should powder be found in the stomach, even if adhering to the eroded parts, it should not be deemed an unequivocal proof of poison till its poisonous quality has been satisfactorily determined.—20.

Animal poisons.

The poison from the sting of the scorpion of this country is far less potent than that of the African scorpion. The violent symptoms which arise from it in Africa are rarely met with here, or in other regions not very hot.—28.

The noxious effects of the bite of the viper are sometimes very sudden, so that they would appear to be propagated through the medium of the nerves.

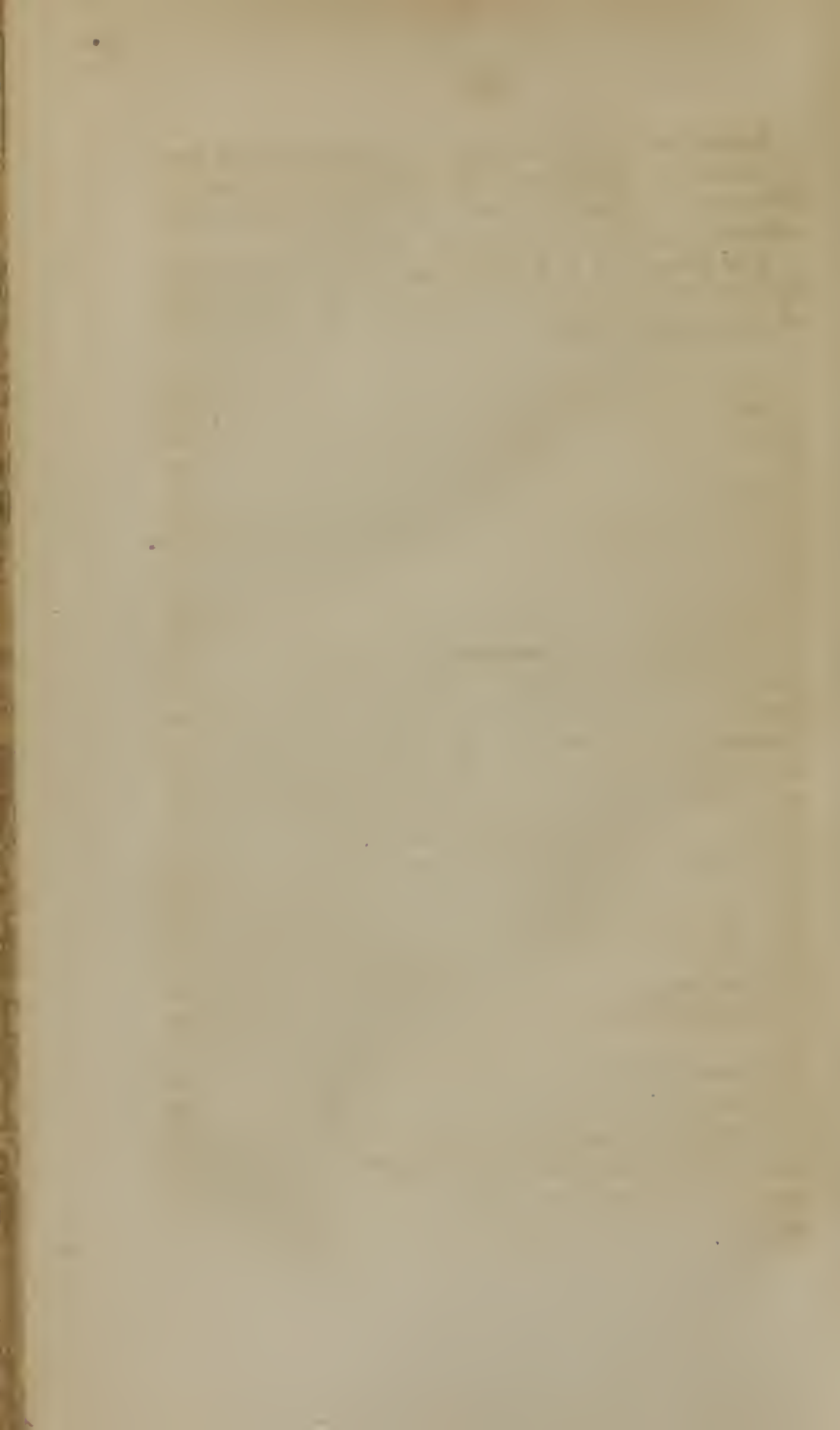
In small animals destroyed by this poison, the blood has sometimes been found coagulated. At those nor coagula are formed, but the blood retains its fluidity. In some it possessed a lively and bright red colour, in others it was black, and disposed to putrefaction.—33.

The usual symptoms arising from the poison of the viper are, vomiting and convulsions, often purging, and bloody urine. The former does not appear attributable to inflammation in the stomach, but to an affection of its nerves.—35.

Icterus, which so frequently occurs after the bite of the viper, probably arises from the same nervous influence, producing spasmodic constriction in the commencement of the hepatic ducts.—36.

The history of Cleopatra has been handed down to show the speedily fatal qualities of the venom of the asp.—37. 46.

THE END.



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